

# FLIGHT

&  
The AIRCRAFT  
ENGINEER.

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

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## Flight and The Aircraft Engineer.

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## EDITORIAL COMMENT.



WITH the full moon this week end and favourable conditions for enemy airmen to carry out further raids on the Metropolis, a great deal of interest centres about the question of to warn or not warn.

It is one to which there are distinctly two sides, as has been found in the case of daylight warnings in London and in other parts of the country. If the warning was invariably, or even in a majority of cases, actually followed by an attack from the air, then the case for giving warning might be considered as proved up to the hilt. As a matter of fact, however, it is all the other way, and the number of cases in which warning of a probable raid upon London is followed by actual attack is relatively small, and it is to be questioned if the nervous tension inflicted on the population by the anticipation of raids that do not materialise is not almost as harmful as the actual damage to life and property caused by those that do.

### Night Air Raid Warnings.

So far as the specific case of London is concerned, it must also be remembered that we are dealing with a city of vast distances, so vast that it is possible for a raid of considerable magnitude to take place in one district without others being aware that anything untoward is happening. If warnings are to be given at all, they must be general warnings. 'It is impossible for the authorities to say that an enemy raid is likely to happen and that bombs will probably be dropped, let us say, within a mile radius of Kennington Oval and that the population of the district will do well to get to cover. All the outlying observation stations can say is that a number of enemy machines are making for London, but whether they will get there at all, or whether they will drop their bombs on Chiswick or Barking, no one can say. Therefore, it logically follows that both Chiswick and Barking—with the whole of the districts intervening—must be given a general warning. That means some seven millions of people have their nerves put on edge by a warning which, perhaps, remotely concerns a quarter of a million. We say remotely because it is not more than one in four or five anticipated raids which actually comes off. Apart from the nerve strain, there is always the real danger that a system of night warnings might actually increase the number of raid casualties by bringing people out of their homes, where they are reasonably safe, into the streets where they would be in danger not only from enemy bombs but from our own gun-fire. Taking the case all round, we are decidedly with the authorities in their decision not to institute general warnings of threatened night raids, although there exists a strong case in favour of warning being given up to, say, about midnight.

### "The Air as a Career."

Under this heading a writer in the *Daily Mail* sees in the aircraft industry of the future at least a partial solution of the vexed problem of "what to do with our boys." He believes that by the air thousands of lads now in their teens will gain not only comfortable livelihoods but really big incomes in the years to come after the war. Aeroplanes in 1923, he says, are going to be very much like motor cars in 1900—the rich man's hobby; and the aeroplane industry in its many branches offers splendid opportunities for the right sort of boy who is given the training now to fit

him for the keen and expert business life of 10 years hence.

"The careful father need not fear that by encouraging in his boy an interest in aeronautics he is leading him on to an early grave. Flying in war-time is fraught with danger because machines are flown that are designed for speed, mobility, and swift manœuvre, the essentials of a fighting machine. But even to-day there are aeroplanes in use for training pilots for the Army and Navy which are all but 'fool-proof'—machines which nothing but sheer accident will cause to 'crash.' Accidents will happen to every vehicle. A burst tyre on a swiftly moving motor car, a broken axle on an express train, a faulty frame in a 'push' bicycle even, will lead to fatal accidents; there must always be risks, and the risks of the air will not be disproportionate when once science and craft set themselves to the task of making safe flying machines.

"And just as every man in the motor-car industry is not a racing driver, so every man in the aeroplane industry will not be a pilot; for each man who flies there must be scores who will work on the ground to prepare his machine for him. The men who work on the ground will be the men who make the money, the men who fly mostly those who spend it."

Generally speaking, we agree with the writer's conclusions, though we are inclined to think that in places he is inclined to let enthusiasm get away with sound judgment. Undoubtedly he is right in saying that there is a decided future in the aircraft industry for the boy of the right sort, but he is certainly not correct in forecasting even for the "right kind of boy" a career which in a few brief years will turn him almost automatically into a millionaire. He would have been better advised if he had pursued the parallel of the motor-car industry, in which a few have amassed large fortunes, a number have achieved modest competencies, and very many are able to earn quite comfortable livings. It is only in businesses of a speculative nature that everyone, rank and file as well as the people who have the direction of affairs, really makes a lot of money, and we believe that when at long last the war is over and we settle down to take stock we shall find that the aircraft industry has ceased to be speculative and has become a solid business proposition which will offer a substantial career to the aspirant, but one devoid of the dazzling possibilities which our contemporary's writer would credit it with. And we had much rather see it that way. What is desirable more than anything else is that the aircraft industry should become a real and established industry as distinct from that mixture of glamour and uncertainty that distinguished it until the war came to give it the opportunity of proving itself 10 to 20 years before it could otherwise have emerged from the chrysalis to stand forth as an industry comparable to its older sister of the car.

The writer of the article under discussion is on better ground when he argues that the careful father need not fear that in encouraging his son to an interest in flying he is leading him on to an early grave. As a matter of fact, we believe the public at large is really beginning to grasp the fact that under ordinary conditions, flying is as safe as any other mode of travel. People know that there must be accidents under war flying conditions, and the general attitude is one rather of wonder that there are not more than one of surprise at their number. The vast expansion of the flying services has been the governing factor in the change of viewpoint from which the man in the street

regards flying. There is practically no one in the country who has not a relative or at least a friend in either one of the two fighting air services and the effect has been of enormous educative value, since it has brought home to the layman at first hand almost, how really safe flying has become. Therefore, we do not fear that there will in future be any lack of the right material for the industry because of the opposition of parents or guardians to the adoption by their charges of a "dangerous" occupation.

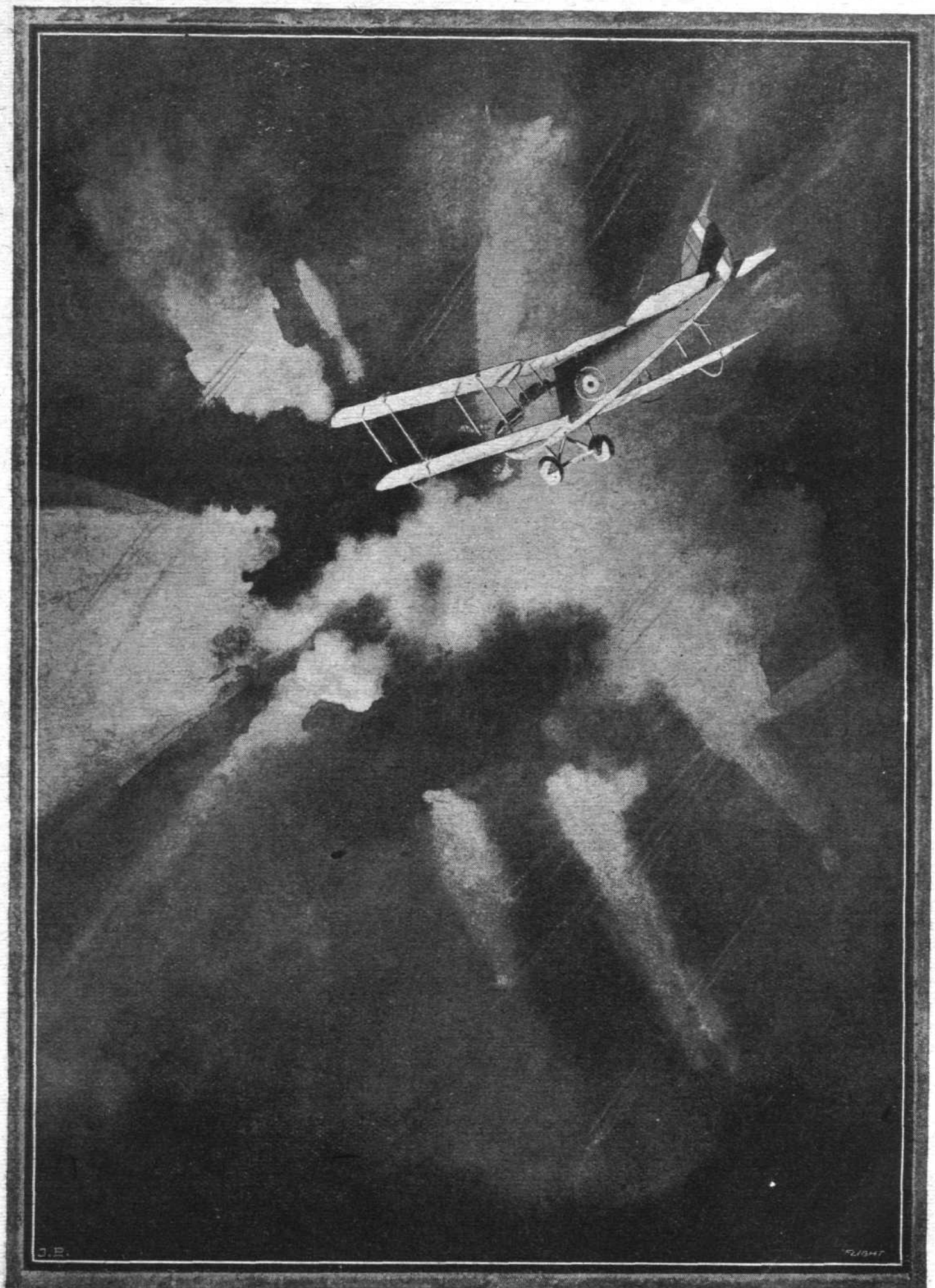
To sum up, there is no doubt at all, to our way of thinking, that the aircraft industry does hold out an excellent prospect for the lad who is serious and who enters it prepared to work as hard and as well as he would have to do to make good in any other industry or profession. But it will offer no more opportunities than any other business to those who desire to achieve position and competence by a royal road. There is no way nowadays to such position and competence save by hard work, study, and devotion to duty and if the "right kind of boy" is prepared to enter the aircraft industry with that firmly fixed in his mind it will offer him as good a career as any, and better than most, other professions.

#### The Work of Our Airmen.

We are glad to see that *The Times* has been at some pains to drive home to the public which, justly incensed at the apparent immunity from punishment of enemy raiders over British open towns, is inclined to blame the Air Services, that the fault does not lie at that door. In a leading article in a recent issue *The Times* after traversing at some length the facts of the work of our airmen at the front, says:—

"In one respect the Germans have attained great skill. Some of their anti-aircraft gunners have, by long practice, become extremely accurate; yet, if the public knew how often our squadrons come under prolonged and heavy German fire, and return after accomplishing their objects without a single loss, they would perhaps be less critical of our air defences in this country. As to the constant bombing of German aerodromes in Belgium, it is hard to estimate the precise damage inflicted, but there is not the slightest doubt that many of our raids result in very considerable destruction of enemy material. It is reasonable to assume that these raids greatly lessen air attacks directed against England. If our airmen were not constantly attacking the aerodromes in Belgium we should probably be subjected to much more frequent visitations in the eastern counties. No doubt air warfare is still in an intermediate phase. The time may come when the duties which now occupy most of the time of the air services will be regarded as subsidiary, and when the offensive possibilities of the new arm will be developed on an infinitely larger scale. Such changes, should they ever come, cannot be rapid. Most people do not realise that aeroplane construction is now an exceedingly delicate, complex, and difficult business. It is far easier to talk theoretically of attaining victory through the air than to provide rapidly the multitude of machines, and of men to pilot them, which a great expansion of air warfare requires."

This is a point of view upon which we have insisted ever since the enemy created the fashion of bombing from the air our open and undefended areas. We have never gone out to be too critical of the actual defences of London or any other of our large cities, for the



**"FOR CONSPICUOUS GALLANTRY."**—In the latest list of honours Second Lieutenant J. C. Currie, R.F.A., S.R., attd. R.F.C., was awarded a bar to his M.C. for conspicuous gallantry and devotion to duty when acting as observer to another officer. They faced a violent thunderstorm, accompanied by a gale of wind and blinding rain, which had compelled all other machines to return to their aerodromes or to make forced landings, in order to locate the position of our infantry in the front line. This they successfully did, having spent 1½ hours in the air under fearful conditions, and returned with an accurate and valuable report to headquarters.

reason that we have always been able to appreciate the enormous difficulty of creating defences which can secure absolute immunity from attack—indeed, we might say that we realise its impossibility. That impossibility is sufficiently demonstrated, as *The Times* points out, by the immunity enjoyed by our own airmen in their raids on German aerodromes, ammunition stores and communications.

So far as concerns *The Times* argument that it is easier to talk theoretically of attaining victory through the air than to provide the wherewithal, this is almost, if not quite, a platitude. Of course, it is much easier to talk about anything than to do it. We do not know that there has been anything in the shape of criticism of the responsible authorities because they have not been able to provide us with a sufficient number of aircraft to enable us to win the war out of hand. No one who is at all conversant with the state of our resources at the outbreak of war, or of the steps that have been possible since to develop them would have the temerity to say that we ought to have been by now in possession of a fleet of aircraft sufficiently large to wipe the enemy out of the sky and take the war through the air to him in a way that should be immediately decisive. What has been the subject of criticism—and we think of legitimate criticism—is that we have not made the best of the resources which, wisely used, would have given us a definite fighting superiority over the enemy at the front and would, at the same time, have given us machines to spare for a policy of counter-raids on German towns which would have given the enemy to think that the raiding game is not worth the candle. The Italians, although their resources are not at all comparable to our own, have managed to attain such an ascendancy that they have stopped all Austrian raids on undefended places and if they could do it, why not ourselves? We shall be told, doubtless, that Austria's resources and Germany's are two different affairs—that they are not comparable. Neither, on the other hand, are those of Italy and the British Empire, and it does seem to emerge that while the one has made the best uses of her resources the other has not. That is, so far as we are concerned, the main direction of the criticisms that have from time to time been levelled at the administration of the flying services. We are glad, however, to know that this sort of thing is now a back number, and that the Hun, to his cost we hope, will soon have practical demonstration of the fact.



#### R.N.A.S. Work in Mesopotamia.

In a report by Captain Wilfrid Nunn, C.M.G., D.S.O., R.N., on the operation of His Majesty's gunboats in Mesopotamia from December, 1916, to March, 1917, there is the following reference to the work of the R.N.A.S. :—

"The 14th Kite Balloon Section, R.N.A.S., commanded by Commander Francis R. Wrottesley, R.N., marked for us on many occasions, besides the useful work it has done keeping look-out for the Army. Aeroplanes have also been frequently put at the disposal of the Royal Navy for spotting."

#### Italians Out to Fly the Atlantic.

FROM Washington, the *Paris New York Herald* learns that some Italian aviators are now in the United States with a view to flying over the Atlantic on a Caproni machine. They are preparing for the attempt by making extended flights from Newport News, Washington and New York.

#### A Six-Passenger, Six-Hour Record.

POSSIBLY in the same connection, from Washington it was announced on September 14th that on the previous

"Only  
in the  
Air."

In the course of his able description of the Battle of Menin Road, as last week's affair will probably be known to history, Mr. Beach Thomas makes the significant statement that "only in the air is the enemy anything but inferior to his past." He does not enlighten us on the point of whether it is that the enemy is able to maintain his relative position in the matter of numbers of machines, or whether it is that the *personnel* of the German flying service is the one branch of the army that is not becoming demoralised under the terrific pressure of events in the West. Whichever way it is scarcely matters. The significance of it is, as we see it, that the enemy realises as well as ourselves that air-power will be the decisive factor in this war of the nations, and is striving with might and main to maintain so much of equality as his fast dwindling resources will permit. That he can ever again attain to an absolute equality, let alone a superiority, of aerial force he must know as well as the Allies is hardly likely. The latter have all the resources of the world in material and manufacturing facilities at their backs, while the Central Powers are absolutely dependent upon their own internal resources, which must be on the way to exhaustion by now.

When we speak of exhaustion, it must be taken in a relative sense and not at all to mean that there is any immediate prospect of Germany disappearing from the air as a consequence of sheer inability to obtain the materials for the construction of aircraft. To do them bare justice, the Germans are excellent hands at making shift with the material to hand—they are past masters in the art of substitution. But the important thing for us to bear in mind is, as we have said, that they evidently realise what preponderating air power means and are determined to strain every resource, material and moral, to prevent us from attaining that measure of superiority which will result in the defeat from the air they fear. Therefore, we on our part cannot afford to mark time simply because our superior resources have enabled us to obtain a fighting superiority. Equally with the enemy we must concentrate ever greater efforts on the production of more and yet more aircraft, so that our superiority may become absolutely dominating and decisive. It is the road we are already following, but those in authority must see to it that no wrong turning is taken in reaching the goal.

day Capt. Riznati, an Italian military pilot, made a flight over Virginia lasting six hours and carrying six passengers. The machine used was a Caproni, and the flight, it is said, was made in the teeth of a gale.

#### Sweden and Aerial Communications.

IF a message from Stockholm is correct, the Swedish Government is now very much alive to the future of aviation. Plans are said to have been prepared for the establishment of aerial routes, after the war, from the interior of Sweden to places abroad. It is stated that the Swedish Chamber of Commerce in London is working on a project for a line between Sweden and England, and the German Government has been asked to authorise another between Sweden and Sassnitz.

#### Holland Takes Up Seaplanes.

EVIDENTLY the Dutch Government realises the increasing importance of aircraft, as it is announced that the new Dutch Naval Budget calls for the provision of 288 aeroplanes of various kinds.

## HONOURS.

### Honours for the R.F.C.

THE following is a continuation of the list of awards announced in the *London Gazette* of September 17th, the first part of which appeared in our last issue:—

The King has been pleased to confer the Military Cross on the following officers in recognition of their gallantry and devotion to duty in the field:—

Lt. R. DUNCAN, Can. Mtd. Rif. and R.C.—For conspicuous gallantry and devotion to duty in carrying out the duties of artillery pilot. When a hostile attack was imminent he carried out a reconnaissance at a very low altitude, which enabled him to observe and report upon the position of the enemy infantry well behind their front line. He also accurately located their artillery, although his machine was much damaged by fire from the ground. He displayed splendid fearlessness and determination.

Lt. (Temp. Capt.) R. L. KELLER, R. War. R., S.R., and R.F.C.—For conspicuous gallantry and devotion to duty in attacking hostile aircraft, destroying one, and driving down others out of control. His dash and offensive spirit on all occasions have been splendid.

Temp. 2nd Lt. E. MANNOCK, R.E. and R.F.C.—In the course of many combats he has driven off a large number of enemy machines, and has forced down three balloons, showing a very fine offensive spirit and great fearlessness in attacking the enemy at close range and low altitudes under heavy fire from the ground.

2nd Lt. A. E. MCKEEVER, R.F.C., S.R.—For conspicuous gallantry and devotion to duty, particularly when on offensive patrol. He attacked eight enemy aircraft singlehanded at close range, and by his splendid dash and determination destroyed one and drove five down completely out of control. He had previously shown exceptional fearlessness in attacking the enemy when in superior numbers, and in the space of three weeks he destroyed eight hostile machines, setting a very fine example to his squadron.

Temp. Lt. (Temp. Capt.) J. T. MILNE, Gen. List and R.F.C.—Whilst leading offensive patrols, he has shown great determination and courage in attacking hostile formations, although in superior numbers, at close range. He has also done long and arduous reconnaissances and secured good photographs under very adverse conditions and heavy fire, displaying throughout an admirable spirit of fearlessness and energy.

2nd Lt. (Temp. Capt.) R. RAYMOND-BARKER, Gen. List and R.F.C.—For conspicuous gallantry and devotion to duty when leading a fighting patrol. He attacked a large hostile formation, destroying two of them. He has also done excellent work in leading distant photographic reconnaissances, notably upon two occasions when his skilful leadership enabled photographs to be taken of all the required hostile area in spite of repeated attacks from enemy aircraft. He has helped to destroy seven hostile machines, and has at all times displayed conspicuous skill and gallantry.

2nd Lt. A. C. REEVES, R.F.C., S.R.—For conspicuous gallantry and devotion to duty in artillery observation, contact patrols and reconnaissance. He has continually done very daring and excellent work at low altitudes with a fine disregard of hostile fire and adverse weather conditions, and he has contributed information of the greatest value by his enterprise and fearlessness on all occasions.

2nd Lt. C. R. RICHARDS, R.F.C., S.R.—For conspicuous gallantry and devotion to duty when on offensive patrols in attacking and shooting down hostile machines. On one occasion he shot down four in one day, displaying great dash and a fine offensive spirit.

Temp. 2nd Lt. (Temp. Lt.) A. ROULSTONE, Gen. List and R.F.C.—For conspicuous gallantry and devotion to duty when engaged in aerial fighting and in photographic reconnaissances. In spite of continual hostile attacks he has proved most successful in securing photographs, and on several occasions he shot down enemy machines out of control, displaying skilful manœuvring and great determination.

Temp. Capt. H. P. RUSHFORTH, Gen. List and R.F.C.—For conspicuous gallantry and devotion to duty in leading bombing raids, the majority of which have been on distant objectives. Notably on one occasion he led a most successful raid under extremely adverse weather conditions, in spite of which the objective was reached and bombed from a low altitude, after which the whole formation of eight machines returned in safety, after a total flight of over five hours. The success of the operation was due to his determination and fine leadership.

Temp. 2nd Lt. (Temp. Lt.) O. J. F. SCHOLTE, Gen. List and R.F.C.—For conspicuous gallantry and devotion to

duty on many occasions whilst carrying out reconnaissances and especially whilst protecting machines returning from patrols. He has continually distinguished himself by discovering hostile aircraft whilst observing from high altitude, and attacking them with great determination and success at close range. His vigilance, combined with his fine offensive spirit, have many times proved invaluable in frustrating hostile reconnaissances and driving their machines down out of control.

Temp. 2nd Lt. C. D. SMART, Gen. List and R.F.C.—For conspicuous gallantry and devotion to duty when acting as pilot to another officer. They faced a violent thunderstorm, accompanied by a gale of wind and blinding rain, which had compelled all other machines to return to their aerodromes or to make forced landings, in order to locate the position of our infantry in the front line. This they successfully did, having spent one and a half hour in the air under fearful conditions, and returned with an accurate and valuable report to Headquarters.

2nd Lt. (Temp. Capt.) D. F. STEVENSON, Yeo. and R.F.C.—For conspicuous gallantry and devotion to duty in carrying out three contact patrols in one day in bad weather, and at low altitudes. Although attacked by enemy machines in superior numbers, he drove them off, and by his fine reconnaissance work brought back valuable information. He has at all times displayed indomitable pluck and initiative.

Lt. O. STEWART, Midd'x R. and R.F.C.—For conspicuous gallantry and devotion to duty. He has done consistent good work for six months, both on escorts and offensive patrols, and has displayed great fearlessness and skill during severe fighting at close range with enemy machines, successfully holding his own, although on several occasions outnumbered by them.

Temp. 2nd Lt. R. M. TREVETHAN, Gen. List and R.F.C.—When on offensive patrols he has continuously displayed the greatest dash and determination in attacking enemy formations, regardless of their superiority in numbers, and has shot down at least four, driving others down out of control.

Temp. Capt. E. L. WILLIAMS, Gen. List and R.F.C.—For conspicuous gallantry and devotion to duty in co-operating with our artillery, often under extremely unfavourable weather conditions. On one occasion in particular, although very much hampered by mist and clouds, he ranged three of our batteries on to a hostile battery position and enabled them to demolish it. His splendid example has been of the greatest value to his squadron.

2nd Lt. W. B. WOOD, Hamp. R. and R.F.C.—For conspicuous gallantry and devotion to duty on many occasions, when engaged with hostile aircraft, during which he has shown a fine offensive spirit and the utmost fearlessness. He has had no less than 23 combats, in the course of which he has destroyed and driven down numerous enemy machines, frequently attacking several single-handed, and on one occasion fighting with his revolver when he had run short of gun ammunition.

The King has been pleased to approve of the award of a Bar to the Military Medal to the following:—

78171 Sergt. J. COWELL, R.F.C. (M.M. gazetted Oct. 27th, 1916).

The King has been pleased to award the Military Medal for bravery in the field to the following:—

6642 1st Air-Mech. F. J. W. ADAMS, R.F.C.

7773 1st Air-Mech. H. R. DEANE, R.F.C.

77982 Sergt. J. G. MORRIS, R.F.C.

6313 Sergt. G. P. OLLEY, R.F.C.

64246 1st Air-Mech. H. V. ROWLATT, R.F.C.

### Belgian Decorations for R.F.C.

It was announced in the *London Gazette* on September 24th that the following decorations have been conferred by the King of the Belgians for distinguished services rendered during the course of the campaign:—

ORDRE DE LEOPOLD.

Commandeur.

Major-Gen. H. M. TRENCHARD, C.B., D.S.O.

Chevalier.

Temp. Capt. N. A. BOLTON, Spec. List and R.F.C.

Lieut. (Temp. Capt.) C. M. B. CHAPMAN, M.C., E. Kent and R.F.C.

2nd Lieut. (Temp. Capt.) J. M. CHILD, Manchester and R.F.C.

Lieut. (Temp. Capt.) J. C. RUSSEL, R.E. and R.F.C.

2nd Lieut. (Temp. Capt.) J. C. SLESSOR, M.C., R.F.C. (S.R.).

Capt. (Temp. Lieut.-Col.) R. R. SMITH BARRY, Flying School.

Capt. (Temp. Major) the Hon. L. J. E. TWISELTON-WYKEHAM-FIENNES, O. and B.L.I. and R.F.C.  
*ORDRE DE LA COURONNE.*  
*Grand Officier.*  
 Lieut. Gen. Sir D. HENDERSON, K.C.B., D.S.O., Director  
 General of Military Aeronautics.  
*Officier.*  
 Lieut. (Temp. Major) J. E. A. BALDWIN, Hrs. and R.F.C.

2nd Lieut. (Temp. Major) L. A. TILNEY, Household Cav. and R.F.C.  
 Major (Temp. Lieut.-Col.) C. F. DE S. MURPHY, D.S.O., M.C., R. Berks. and R.F.C.  
*Chevalier.*  
 Temp. 2nd Lieut. S. COCKERELL, Gen. List and R.F.C.  
 Temp. 2nd Lieut. J. H. O. JONES, Spec. List and R.F.C.  
 Temp. Lieut. W. A. WRIGHT, Gen. List and R.F.C.



## THE ROLL OF HONOUR.

### Reported by the Admiralty:—

#### Killed.

Acting Squadron Commander T. C. Vernon, R.N.  
 Flight Sub-Lieut. N. S. Wright, R.N.

#### Drowned.

Warrant Officer R. Dodd, R.N.A.S.

#### Wounded.

Flight Sub-Lieut. E. Anthony, R.N.  
 Flight Sub-Lieut. C. F. D. Ash, R.N.  
 Lieut. Ll. H. Harries, R.M.A.  
 Flight Sub-Lieut. N. P. Playford, R.N.  
 Flight Sub-Lieut. R. Sykes, R.N.

#### Seriously Injured.

Flight Sub-Lieut. H. J. L. Botterell, R.N.

#### Accidentally Injured.

Flight Sub-Lieut. E. Sturman, R.N.

#### Missing.

Flight Sub-Lieut. H. S. Broughall, M.C., R.N.  
 Flight Sub-Lieut. E. W. Desbarats, R.N.  
 Flight Sub-Lieut. E. V. J. Grace, R.N.  
 Flight Sub-Lieut. R. E. McMillan, R.N.  
 Flight Sub-Lieut. J. H. Winn, R.N.

#### Previously reported Missing (feared Lost), now Officially reported Prisoners.

Observer Sub-Lieut. J. C. A. Jenks, R.N.  
 Flight Lieut. W. E. Robinson, R.N.

### Reported by the War Office:—

#### Killed.

2nd Lieut. B. B. Bishop, D.C.L.I., attd. R.F.C.  
 2nd Lieut. A. G. Davidson, Gord. Hrs., attd. R.F.C.  
 Lieut. A. W. Peacock, R. Scots, attd. R.F.C.  
 Lieut. J. O. Pilkington, R.F.C.  
 2nd Lieut. H. C. Smith, R.F.C.  
 2nd Lieut. A. E. Wear, R.F.C.  
 61923 2nd Air-Mech. R. Beatford, R.F.C.

#### Accidentally Killed.

Lieut. A. A. Legeré, Can. For. Corps, attd. R.F.C.

#### Died of Wounds.

2nd Lieut. E. F. C. Budd, R.E., attd. R.F.C.  
 Lieut. J. C. Crosbie, R.G.A., attd. R.F.C.  
 65181 1st Air-Mechanic W. Harmston, R.F.C.

#### Previously Missing, now reported Killed.

Lieut. W. J. Chalk, Manitoba, attd. R.F.C.  
 Lieut. T. E. Goodwin, Can. Gen. List, attd. R.F.C.  
 2nd Lieut. L. A. McPherson, R.F.C.  
 Captain L. S. Platt, Lrs., attd. R.F.C.  
 2nd Lieut. J. H. Sayer, R.F.C.

#### Died.

2nd Lieut. Z. E. Freadman, Aus.F.C.  
 33605 2nd Air-Mechanic W. Booth, R.F.C.  
 51493 3rd Air-Mechanic P. McCabe, R.F.C.  
 64692 2nd Air-Mechanic R. H. Wadsworth, R.F.C.  
 37319 1st Air-Mech. T. C. Walker, R.F.C.

#### Previously Wounded, now reported Died of Wounds.

Lieut. R. N. Treadwell, R.F.C.

#### Previously Missing, now reported by the German Government Killed or Died of Wounds.

1054 Flight Sergt. A. G. Shepherd, R.F.C.

#### Previously Missing, now reported Died.

Lieut. J. L. MacFarlane, Brit. Col., attd. R.F.C.  
 Lieut. D. J. McRae, Albta., attd. R.F.C.

#### Previously Missing, now reported Missing, believed Killed.

27234 Actg. Sergt. W. S. Wickham, R.F.C.

#### Wounded.

Captain W. G. Barker, M.C., R.F.C.  
 2nd Lieut. L. Cann, R.F.C.  
 Captain C. F. Collett, R.F.C.  
 Lieut. H. W. Gammon, R.F.C.  
 2nd Lieut. C. R. B. Halley, R.F.C.  
 2nd Lieut. R. V. James, Durham L.I., attd. R.F.C.  
 2nd Lieut. A. D. Light, R.F.C.  
 Capt. W. G. B. McKechnie, R. Sco. Fus., attd. R.F.C.  
 Capt. J. T. Milne, M.C., R.F.C.  
 2nd Lieut. R. de L. Stedman, R.F.C.  
 Captain J. W. Thomson-Glover, I.A. Inf., attd. R.F.C.  
 2nd Lieut. H. G. Topham, Suff., attd. R.F.C.  
 2nd Lieut. L. N. Waddell, R.F.C.  
 2nd Lieut. H. Weightman, R.F.C.  
 2nd Lieut. M. West-Thompson, R.F.C.  
 2nd Lieut. A. L. Wylie, M.C., R.F.A., attd. R.F.C.  
 Lieut. F. Yorke, Ches., attd. R.F.C.  
 5703 1st Air-Mech. G. F. Atkins, R.F.C.  
 13411 2nd Air-Mech. F. W. Bates, R.F.C.  
 43690 2nd Air-Mech. A. Breane, R.F.C.  
 63754 2nd Air-Mech. G. C. E. Cooper, R.F.C.  
 56634 2nd Air-Mech. B. C. Fisher, R.F.C.  
 77335 Corpl. C. R. Goffe, R.F.C.  
 11363 2nd Air-Mech. J. J. Keene, R.F.C.  
 5081 1st Air-Mech. R. Lambert R.F.C.  
 10026 2nd Air-Mech. E. W. Liddiard, R.F.C.  
 65054 2nd Air-Mech. J. McKillop, R.F.C.  
 P. 9273 2nd Air-Mech. E. Perrott, R.F.C.  
 43673 2nd Air-Mech. R. Scott, R.F.C.

#### Previously Prisoners, now reported Wounded and Prisoners in German hands.

Capt. F. P. Dow, Yeo., attd. R.F.C.  
 Lieut. D. C. G. Murray, R.E., attd. R.F.C.

#### Missing.

2nd Lieut. H. T. Batson, R.W. Surr. R., attd. R.F.C.  
 2nd Lieut. E. B. Denison, R.F.C.  
 2nd Lieut. W. E. De B. Diamohd, R.F.C.  
 2nd Lieut. S. W. Dronsfield, R.F.C.  
 2nd Lieut. E. J. Halliwell, R.F.A., attd. R.F.C.  
 2nd Lieut. E. T. H. Hearn, R.F.A., attd. R.F.C.  
 Capt. L. F. Jenkin, M.C., R.F.C.  
 2nd Lieut. J. A. MacKay, R.F.C.  
 2nd Lieut. W. S. Mansell, E. Surr. R., attd. R.F.C.  
 Lieut. O. L. McMaking, Yeo., attd. R.F.C.  
 2nd Lieut. O. C. Pearson, R.F.C.  
 2nd Lieut. E. G. C. Quilter, R.F.C.  
 2nd Lieut. G. P. Robertson, R.F.C.  
 Lieut. N. C. Saward, R.F.A., attd. R.F.C.  
 2nd Lieut. K. R. Sayers, R.W. Kent, attd. R.F.C.  
 2nd Lieut. A. J. S. Sisley, R.F.C.  
 2nd Lieut. E. H. P. Streather, R.F.C.  
 88163 2nd Air-Mech. W. Addison, R.F.C.  
 23052 Corpl. H. G. Bessenger, R.F.C.  
 1166 Sergt. E. J. Comerford, R.F.C.  
 87597 2nd Air-Mech. E. Kelly, R.F.C.  
 78930 2nd Air-Mech. F. J. Smith, R.F.C.

#### Previously Missing, now reported Prisoners in German hands.

2nd Lieut. G. Davis, R.F.A. and R.F.C.  
 Captain F. N. Hudson, M.C., Buffs, attd. R.F.C.  
 Lieut. W. B. Hutcheson, Can. Eng., attd. R.F.C.  
 Lieut. C. Malloch, E. Ont., attd. R.F.C.  
 Captain H. O. D. Wilkins, Bedf., attd. R.F.C.

#### Previously Missing, now reported Prisoner.

78530 2nd Air-Mech. C. Bemister, R.F.C.

#### Previously reported believed Taken Prisoner at Kut-el-Amara, now reported Prisoner of War in Turkish hands.

1299 1st Air-Mech. L. V. Claridge.

# WING BRACING AND HEAD RESISTANCE.

By MARCO POLO.

IN comparing the performances of modern aeroplanes with those of pre-war days, one cannot but be impressed by the enormous progress made during the few intervening years. This progress has not been in one direction only, but is distinctly noticeable in every aspect of the capabilities of an aeroplane, such as climb, manoeuvrability, reliability, duration and speed. To what can this great improvement be ascribed? Not to any single thing by itself, but to general improvement in detail design. As far as the speed and climb are concerned, progress has been to a very large extent due to engines of greater reliability and higher power. It

In Fig. 1 is shown diagrammatically the front spars with their wire bracing of what may be termed a standard scouting biplane. The span is 28 ft., and the chord and gap are 5 ft. respectively. Although a stagger is almost universally employed in modern scouts, we have chosen the vertical type as being simpler to deal with, and as this does not materially affect our argument, it is, we think, permissible. The "free length" of spar is about 8 ft. 3 ins., a somewhat excessive distance for great strength, and calling for a fair size spar, but the proportions, if not the actual dimensions, conform approximately to standard practice. The attachment of the top

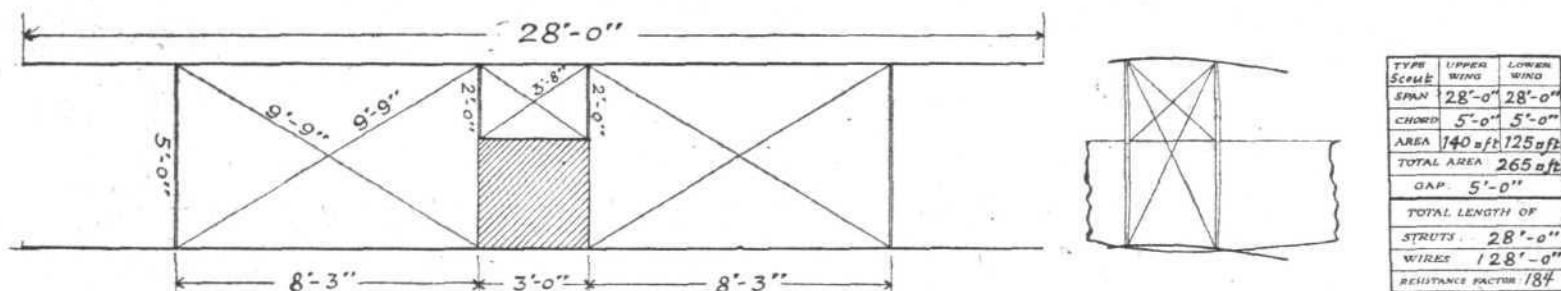


Fig. 1.—Diagram of the wing bracing of a standard scout.

is doubtful, however, whether this increased power is the sole, or even the chief, cause of the progress made. Very great improvements have been made in the aeroplanes themselves, notably as regards wing sections, of which there are now in existence examples far exceeding in efficiency those available before the war. Another point that has received the closest attention of designers and constructors is the reduction of head resistance. This applies not only to the body of the aeroplane, but also to the wing bracing and strutting, and it is the latter aspect with which it is intended to deal in the present notes.

In order to provide a foundation on which to base a comparison of various forms of wing bracing it will be assumed that a designer is faced with the problem of designing a machine to fulfil certain given conditions, and that in order to do this he

plane is of the type termed "canopy" mounting by the Germans, i.e., there is a short top plane centre section, supported on four vertical struts from the body.

From the small tables of dimensions attached to each diagram it will be seen that the last figure in the table is called "Resistance factor." This expression, which is employed for want of a better term, had better be explained before proceeding any farther. Before it is possible to make a fair comparison between the various forms of wing bracing in a machine of the scout type, it is necessary to assign to each of the component parts of that bracing a value for resistance. Now, as the purpose of the present notes is not to go into calculations of the actual resistance in pounds at a certain speed, but merely to compare one form of wing bracing with another, it will not be necessary, for the purposes

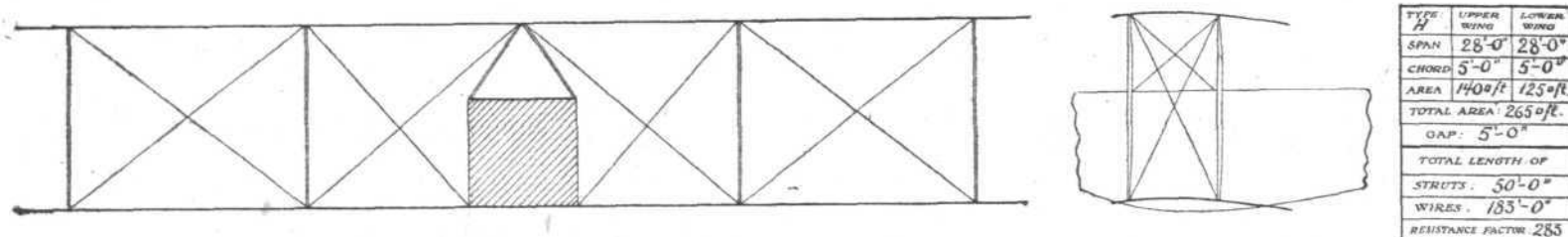


Fig. 2.—Diagram of the wing bracing of a scout of the Halberstadt type.

finds that, with the power and wing sections at his disposal, he requires an area of 265 sq. ft. This is, perhaps, a somewhat larger area than that used on the latest fighting machines, but as this fact will not affect the argument qualitatively, it has been chosen for the sake of convenience. Now, in order to get the best possible results out of his machine, with the area, wing section and power given, assuming that the form of body has already been decided upon, the designer will naturally ask himself what is the form of wing bracing that will give the least resistance, conforming, of course, with the question of proper structural strength.

of the argument, to know the actual resistance per foot run of the wires and struts employed, but it will be required to know how the resistance of one unit length of strut compares with that of one unit length of wire.

From the reports published by the various institutions carrying out wind-tunnel experiments, it would appear that a 10-gauge smooth round wire offers approximately the same resistance per foot run as a good section strut of the dimensions employed on a machine of the scout size and type. Since, however, in modern aeroplanes, at any rate on high speed ones, round wires are never employed, it will

not be fair to assign to the struts the same resistance value as that of the wires. The so-called "streamline" R.A.F. wire, which is not, of course, a true streamline section, is not generally favoured by private designers for various reasons, so I shall refrain from making the comparison with this particular type of wire. A method more generally preferred by many is to employ duplicate cables placed at a distance of about an inch behind one another and having a wood-filling in between them. Although this combination may not give an absolutely true streamline section, its resistance is in all

top planes are attached to a *cabane* instead of to the "canopy" usually found on scouts of British design. Next let us examine how this form of bracing compares with that shown in Fig. 1. The area, as before, is 265 sq. ft. The total length of wires is found to be 183 ft. against the 128 ft. of the standard scout type of Fig. 1. The total length of struts is 50 ft., instead of the 28 ft. found for the standard scout. The "resistance factor" therefore is 283 against 184, quite an appreciable difference, which would reduce considerably the performance, both as regards speed and climb, of the machine

TYPE	UPPER WING	LOWER WING
SPAN	28'-0"	28'-0"
CHORD	5'-0"	5'-0"
AREA	140 sq ft	125 sq ft
TOTAL AREA	265 sq ft	
GAP:	5'-0"	
TOTAL LENGTH OF		
STRUTS:	29'-0"	
WIRES:	128'-0"	
RESISTANCE FACTOR:	186	

Fig. 3.—Diagram of the wing bracing of a scout of the Sopwith type.

probability quite as small as that of an R.A.F. wire, and it will, one is inclined to think, be found to be considerably stronger, especially against sudden loads, such as those imposed on the cables when flying in a "bumpy" wind. If it be assumed that such a combination of cables and wood fillings will measure  $\frac{1}{2}$  in. by  $1\frac{1}{2}$  in., while the strut sections measure  $1\frac{1}{2}$  in. by 4 ins., we shall take it, in view of the less perfect section of the cables *cum* wood fairings, that the resistance per foot run of the struts will be twice that of the cables. This figure is, admittedly, quite an arbitrary one, and as the whole argument rests entirely upon these relative resistance values, it is, of course, important that they should be correct. I do not think, however, that they will be found to be very far wrong. Data relating to this subject should be available in every designing office, and thus designers should be able to check the accuracy of our assumption. The views of designers on this particular point will be welcomed, since they are in a better position to ascertain the correct ratio. In any case, any error due to incorrectness of this so-called resistance factor will only affect the argument quantitatively.

Referring again to Fig. 1, it will be seen that the "resistance factor" of the standard scout for the area and proportions chosen is 184. This figure is arrived at by multiplying the length of struts by two, the value assigned to strut resistance compared with that of the cables, and adding the product to the total length of wires, or, more correctly speaking, cables. This "resistance factor," then, forms a basis for comparison.

In Fig. 2 is shown the form of bracing employed on the German Halberstadt biplanes, *i.e.*, there are two pairs of inter-plane struts on each side, and the

with the Halberstadt type bracing. It should be pointed out, however, that this bracing would be very much stronger, as the "free length" of spar is considerably shorter than with the one pair of struts arrangement. The reason for its adoption in the Halberstadt is to be sought for in the fact that a large heavy water-cooled engine was fitted, whereas most, or at any rate many, of our small scouts have a much lighter rotary engine. For a light engine the Halberstadt bracing is, therefore, to be considered less efficient than the standard scout bracing.

The first development of what is termed in this article the standard scout bracing is shown in Fig. 3, which is that first introduced by the Sopwith Aviation Co., and since employed by many others. This arrangement differs from the standard only in the placing of the body struts supporting the centre section of the top plane. These struts, it will be seen, instead of forming a vertical continuation of the body struts proper slope outwards a few degrees. An examination of the table of dimensions to the right of the diagram in Fig. 3 shows that the total length of wires is the same as that of Fig. 1, while, owing to the outward slope of the struts, the total length of struts is one foot greater than that of Fig. 1. The "resistance factor" is therefore 186 against the 184 of the standard scout, a negligible difference when it is remembered that by having the struts sloping outwards the "free length" of the upper spar, which is the heavier loaded, is reduced, with a consequent strengthening very desirable in a machine of this type. This arrangement may then be said to be very good, both as regards resistance and strength.

(To be continued.)



#### The Work of Women Munitioneers.

WHEREVER it has been shown, the collection of photographs and samples of women's work in engineering and allied trade, which has been got together by the Ministry of Munitions, has never failed to arouse a great deal of interest, and it is certain that Sheffield will take full advantage of the opportunity of seeing what women are doing to help win the war. Since it was last seen at Newcastle, the collection has been considerably enlarged and those who paid a visit to London to see it when it was first opened will find it well worth their while to inspect it again. It has been arranged in the

Mappin Art Gallery, and was formally opened by the Lord Mayor of Sheffield on Wednesday last; it will remain open, from 11 a.m. to 8 p.m. each day until October 9th.

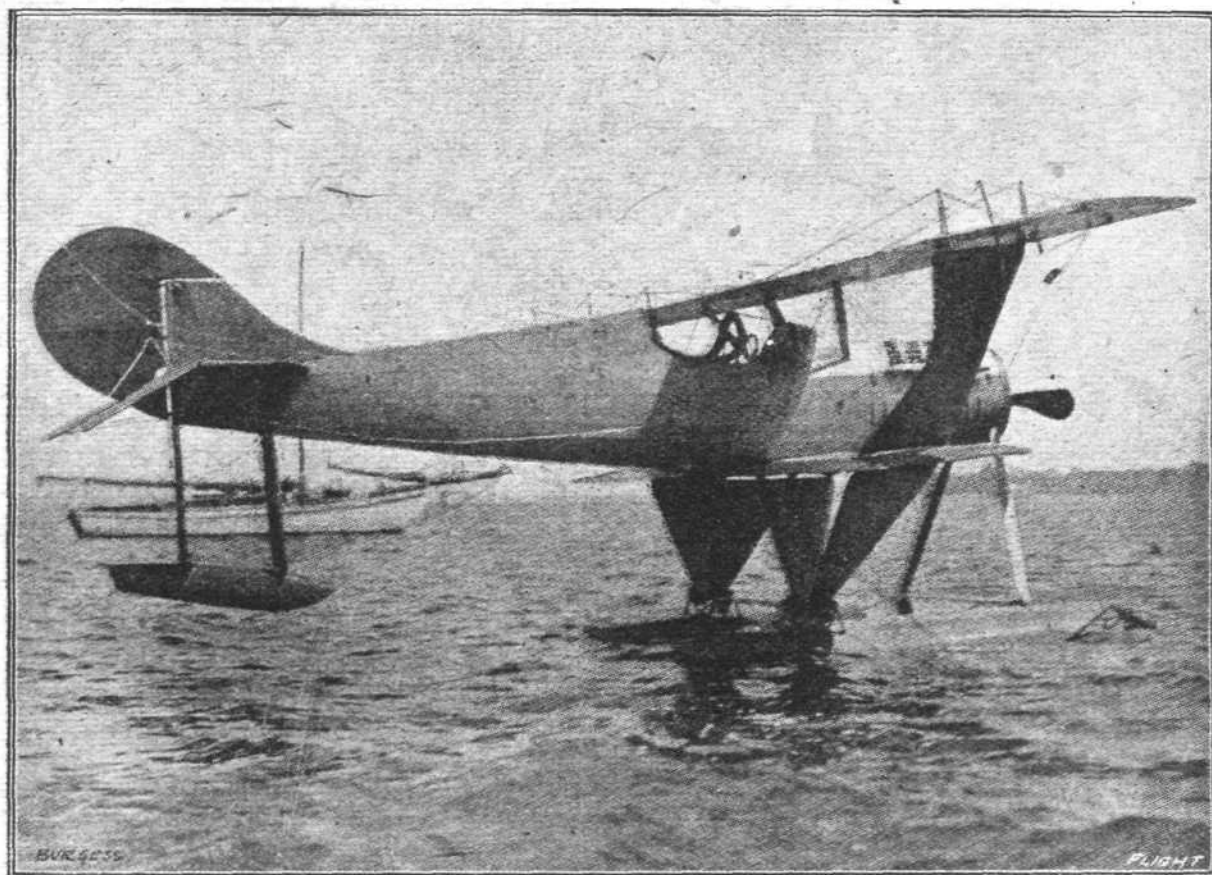
#### An Incident at Verdun.

WHILE the King of the Belgians and President Poincaré were reviewing the troops which played such a stirring part in the recent advance at Verdun, two German aeroplanes appeared overhead. French machines at once attacked and the intruders turned tail, one however paying for his attempt by being brought down in view of the Royal party.]

## THE BURGESS SPEED SCOUT SEAPLANE.

AN interesting type of seaplane has recently been constructed, and tried out, by the Burgess Co., of Marblehead, Mass., U.S.A., namely, the HT-2 speed scout. A short while back we gave an illustration of this machine, and this week we are able to give further particulars and scale drawings, for which we are indebted to our American contemporary, *Aerial Age*. A number of original constructional features have been incorporated in this machine, the most noteworthy of which are the interplane struts, float struts, and the shock absorbing attachment of the floats.

the centre by a pair of metal plates at the wing spars. Each of these sections measures 11 feet span, whilst the outer or overhanging sections, to which the *ailerons* are hinged, measure 5 ft. 10 ins. The two lower plane sections extend 9 ft. 4 ins. at either side of the *fuselage*, which is 2 ft. 6 ins. wide at this point. The front spars are located 8 ins. from the leading edge, and 1 ft. 8 ins. from the rear spar. Ribs are spaced 9 ins. apart. Internal drift wires are terminated to the ends of tapered compression struts which relieve the ribs of compression strains. The overhang, and the inter-



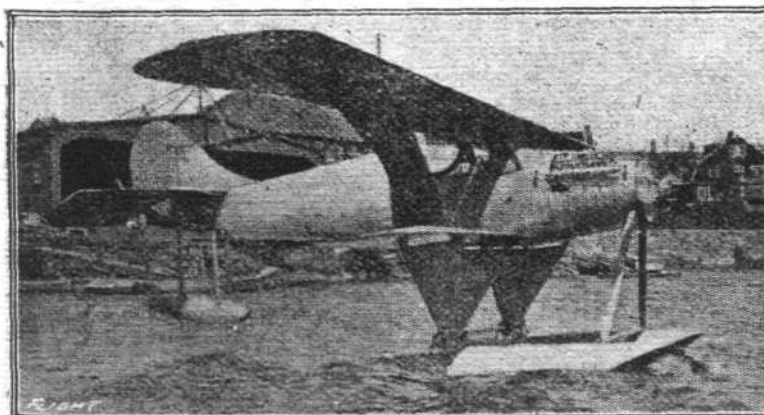
Three-quarter rear view of the Burgess speed scout seaplane.

Numerous test flights were carried out by W. E. Doherty this summer with the object of discovering if the original design could be improved upon. One or two modifications thus suggested may be found on referring to the scale drawings, viz., vertical surfaces on each pair of king posts on the top plane, the elimination of bracing wires on the *ailerons*, the cutting away of a portion of the top plane above the pilot's seat, and the mounting of the tail float nearer to the *fuselage*. Wherever possible, sharp angles have been eliminated, also, by means of balsa-wood streamlining.

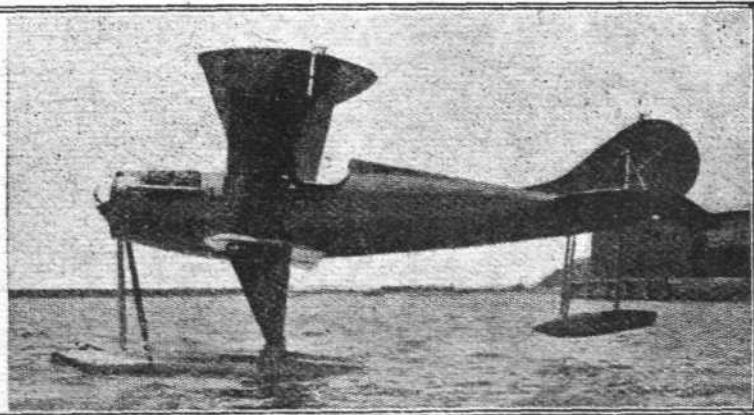
The main planes are comparatively narrow in chord, and have neither stagger, sweep-back, nor dihedral. The upper plane is in four sections, the inner sections being joined in

plane brace wires are doubled, the space between each wire being filled with spruce streamlining strips, the edges of which are routed out to receive the wires.

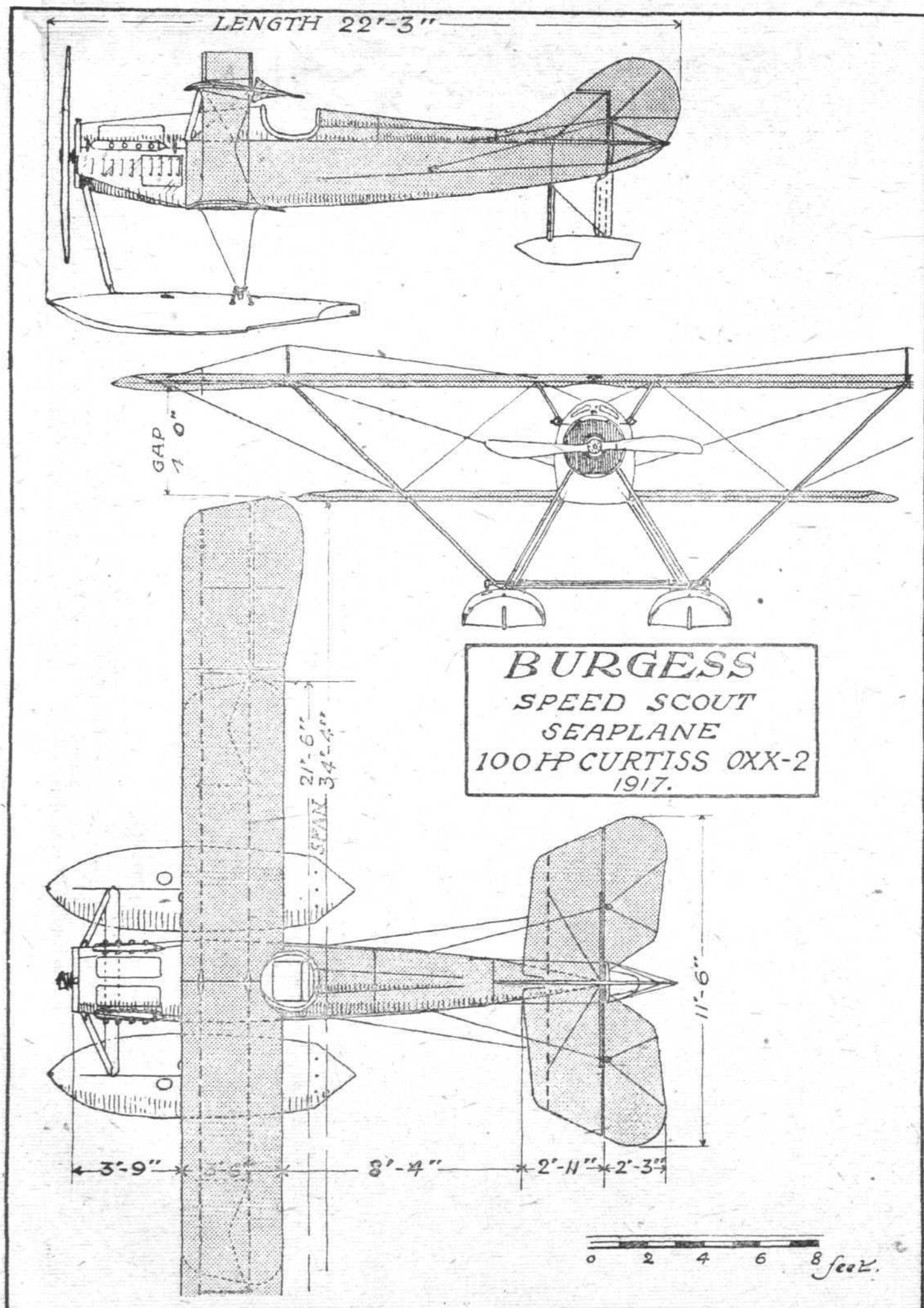
The interplane struts are of spruce, built up to form a K-shape unit, covered with fabric. There is one of these K-units on each side of the *fuselage*, but instead of being vertical they slope inwards from the top plane. In continuation of each of these struts is a pair of V struts extending to the floats, another similar pair being carried up from each float to the body, the whole system of struts thus forming a W when viewed from the front. The K-unit is built up as follows: One spruce member runs from the upper rear spar to the lower front spar, a second member runs from



Three-quarter front view of the Burgess speed scout seaplane.



Side view of the Burgess speed scout seaplane.



THE BURGESS SPEED SCOUT SEAPLANE.—Plan, side and front elevations to scale.

the lower rear spar to the top front spar, whilst a third member connects the upper and lower spars, giving the K shape. The junctions with the planes are filled into a curve with balsa-wood to give a streamline effect. Two pairs of short struts slope outwards from the fuselage to the top plane.

The fuselage is of good streamline shape, being circular in front, tapering to a vertical knife-edge at the rear. The forward part near the engine is covered with louvered sheet aluminium. The sides and top are curved beyond the longerons by means of thin horizontal spruce stringers supported on formers, and covered with fabric. The top of the fuselage is in sections, which are separately removable, and a semi-elliptical streamlining ridge is fitted, starting from the pilot's head rest.

The pilot's cockpit is exceptionally deep and roomy, and the top of the cockpit, above the instruments, is formed with celluloid, providing ample lighting to the interior, at the same time serving as a wind shield. Deperdussin control is installed, and the aileron control passes through the sides of the fuselage at a point 1 ft. above the lower plane in line with the forward edge of the K struts, and runs to the top of the latter, thence to a pulley, attached to the underside of the upper wing spar, to the aileron crank. Control wire openings in the fuselage are protected by heavy skin washers sewn to the fabric.

The tail planes consist of a horizontal stabilising surface, a vertical fin, rudder, and elevators. The latter are hinged to a common spar and work in unison. The root of the vertical fin is built into the curved fuselage top, and the rudder has a small balancing surface forward of the hinge; the lines of the rudder continue in the same curve of the fin. Solid wire braces run from both the forward and rear spars

of the stabiliser to the top of the rudder post; and also from underneath the forward spar to the tail float.

Two main floats, 11 ft. long, 3 ft. beam, and 1 ft. 5 ins. maximum depth. They are spaced 6 ft. 6 ins. from centre to centre, and are connected by two horizontal struts. The forward horizontal strut is located 2 ft. 2 ins. from the bow, and the rear strut, which acts as a shock absorbing axle, 5 ft. behind it. A single strut on each float runs from the horizontal strut to a point on the fuselage near the radiator. The rear "axle" is mounted on the V struts—which are covered in with fabric—extending from the fuselage and lower plane. This "axle" is attached to the floats by rubber chord, in metal guides which allow a vertical movement. By this means of shock absorbing much of the porpoising when taxiing has been eliminated, and many of the hard landings are taken up by it. The floats have a slight V bottom, with a step located 4 ft. from the stern, and turtle-deck tops. A 2-in. air duct passes through the float at the step. The main support for the tail float is provided in a 2 ft. 2 in. extension of the fuselage sternpost, streamlined fore and aft to a width of 7½ ins. A pair of struts, 2 ft. long, support the front end of the float, and bracing wires run from front and rear struts.

A Curtiss OXX-2 100 h.p. 8-cylinder V engine is installed, being totally enclosed by the aluminium cowling. The radiator is mounted in the nose of the fuselage, and is 2 ft. 3 ins. diameter. The tractor screw, specially designed for the machine by the Burgess Co., is 7 ft. 9 ins. diameter by 5 ft. 9 ins. pitch.

The principal dimensions of the Burgess HT-2 are:—Span, top 34 ft. 4 ins., bottom 21 ft. 6 ins.; chord, 3 ft. 6 ins.; gap, 4 ft.; overall length, 22 ft. 3 ins.; overall height, 10 ft.; speed range, 50-95 m.p.h.

#### The Hun's Air Service.

Writing to the *Daily Mail* on Sunday, Mr. W. Beach Thomas says:—

"Only in the air is the enemy anything but inferior to his past.

"Mass attacks on batteries and camps by bombing planes carrying three engines and protected by many scouts are becoming more common occurrences."

Mr. Philip Gibbs, writing to the *Daily Telegraph*, says:—

"His (the enemy's) guns have been very active, bombarding parts of our line intensely, and in the air his scouts and

raiders have been coming over our lines in the endeavour to observe and destroy our troops and batteries, flying low with great audacity, and using machine-guns as well as bombs."

#### Another Prominent Hun Pilot Killed.

It was announced from Berlin on September 18th that Flight-Lieut. Curt Wolff, who had succeeded Baron von Richthofen as leader of Squadron No. 11, was killed in an air fight three days previously. He was last reported in the German reports on July 7th, when he was credited with his 33rd victim.



The village of Bermericourt after drum fire. From a photograph secured by a German aviator.

# The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

## Club House.

The following prices have been fixed for the present by the Committee:—

Bedroom (including Bath)	..	5s. each per night.
Breakfast .. ..	..	2s. 6d.
House Luncheon ..	..	2s. 6d.
House Dinner .. ..	..	3s. 6d.

## Billiard Room.

The Billiard Room is now open for the use of the Members.

## THE FLYING SERVICES FUND.

administered by

## THE ROYAL AERO CLUB.

THE Flying Services Fund has been instituted by the Royal Aero Club for the benefit of officers and men of the Royal Naval Air Service and the Royal Flying Corps who are incapacitated on active service, and for the widows and dependants of those who are killed.

The fund is intended for the benefit of all ranks, but

especially for petty officers, non-commissioned officers and men.

Forms of application for assistance can be obtained from the Royal Aero Club, 3, Clifford Street, New Bond Street, London, W. 1.

## Subscriptions.

	£	s.	d.
Total subscriptions received to Sept. 18th, 1917	11,913	11	9
G. H. Mansfield, Managing Director of the Aircraft Supplies Co., Ltd., 17, John Street, Theobald's Road, W.C.; Proceeds of the sale of copies of "Standard A.G.S. Parts for Aircraft," by Bernard Isaac. (Seventh contribution, making a total of £27 1s. 4d.)	..	2	10 6
The Aerodrome Sports Committee of Sir W. G. Armstrong-Whitworth and Co., Ltd.	..	367	5 11

Total, September 25th, 1917 .. 12,283 8 2

H. E. PERRIN, Secretary.

3, Clifford Street, New Bond Street, W. 1.



[As a number of letters reach us signed with initials only, some of which do not give a complete address, we would point out that such communications cannot be dealt with in our columns. Full name and address, which will not be published, must always be given.—Ed.]

## Notice to Correspondents in General.

Applications for commissions in the Royal Naval Air Service should be addressed to the Director of Air Services, Admiralty, S.W. The necessary form and conditions of entry can be obtained from the Secretary of the Admiralty.

Applications for commissions in the Royal Flying Corps should be sent to the Director-General of Military Aeronautics, Hotel Cecil, Strand, W.C.

Those who wish to enlist in the R.N.A.S. should apply to the nearest naval recruiting station or to the R.N.A.S. Drafting Office, Crystal Palace, S.E. Skilled mechanics are taken whatever their army classification, but unskilled men are only taken if they are classified B1, B2, or C1.

Recruiting for the R.F.C. is closed for the time being, and any enquiries should be made to the Officer Commanding, Royal Flying Corps Depot, Farnborough.

Enquiries with regard to appointments in the A.I.D. should be addressed to the Chief Inspector, Aeronautical Inspection Department, Hotel Cecil, W.C. 2.

**W. E. W. (High Barnet).**—It is difficult to estimate the average life of a propeller blade—disregarding breakages due to faulty landings. So much depends on the weather conditions under which the screw is working. In rainy weather the propeller will naturally get damaged by the raindrops hitting it at a high velocity during flight, while a single flight of any considerable duration in a hailstorm may ruin a propeller.

**D. B. K. (R.F.C., B.E.F.).**—We regret that we cannot settle the dispute, as we have no facilities for measuring the machine in question.

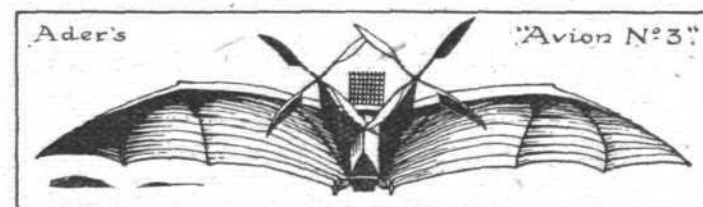
**C. O. O. (Epsom).**—The normal position of the *ailerons* is in continuation of the trailing edge of the fixed portion of the wing. From this normal position the *ailerons* are moved up or down; in fact, they are so interconnected that when the trailing edge of one *aileron* moves below the trailing edge of the wing, that of the opposite *aileron* moves above it. The position of the *ailerons* when making a turn differs according to the type of machine. Some aeroplanes have a tendency

to overbank on a turn, in which case the *ailerons* are called upon to reduce the bank by depressing the inner and elevating the outer one. In other machines the reverse is the case, the bank naturally taken up by the machine being insufficient, and the outer *aileron* being depressed while the inner one is elevated. Again, a good many machines automatically take the correct bank, and in these it is not necessary to use the *ailerons* during a turn.

**A. C. M. (S.W. 10).**—A knowledge of the following engines would be useful: Gnome, Le Rhone, Clerget, Salmson, Anzani, Sunbeam, Rolls-Royce, Beardmore and Hispano. We do not think, however, that you will be expected to "know all about" every one of these.

**R. M. H. (Erith).**—Judging from your rough sketch, we should say the machine mentioned is a de Havilland 5. We have no information as to what machine the pilot in question was flying when he had his accident.

**E. N. (Taunton).**—The accompanying sketch will, we hope, show you the general arrangement of Ader's monoplane.



This machine is generally credited with being the first power-driven aeroplane to leave the ground.

**C. B. (Putney).**—The difference between the Halberstadt biplane illustrated in our issue of July 12th and that in "FLIGHT" for August 23rd may be explained by the fact that minor improvements are always being introduced in machines. The machine described in August 23rd issue is, we believe, one of the latest models, the principal changes being in the balanced *ailerons* and the cowling over the engine, &c. It should be noted, also, that the drawings in our issue for July 12th are only approximate and not strictly accurate. The machine in question is not an R.E., a B-E2e, or B-E12a type.

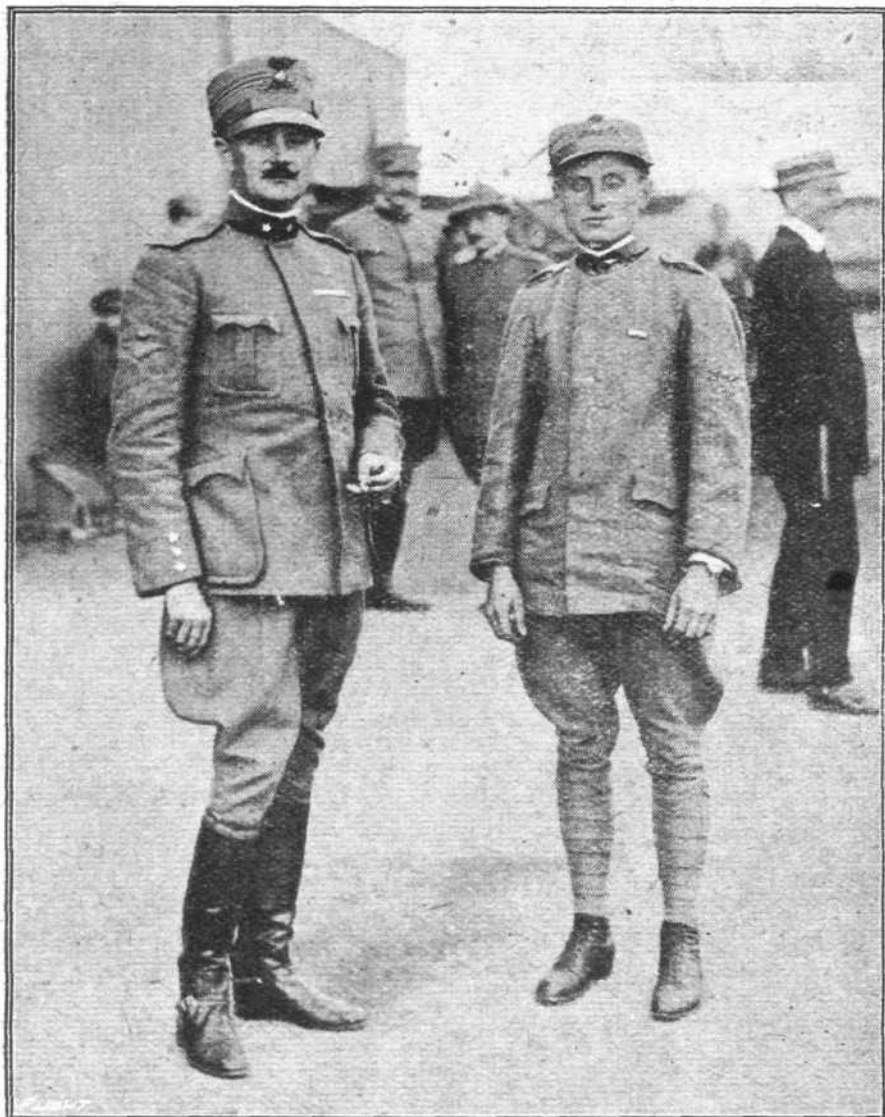
## TURIN TO LONDON NON-STOP.

A NOTEWORTHY achievement in the way of cross-country flying was Capt. the Marquis Giulio Laureati's fine non-stop trip from Turin to London on September 24th, the distance of 656½ miles (1,100 kilometres) being covered in 7 hrs. 22 min. 30 sec.

Piloting an S.I.A. machine, with 200 h.p. Fiat motor, and carrying as passenger Air-Mech. Michael Angelo Tonzo, and two machine-guns, Capt. Laureati left Turin at 7.28 a.m.

this part of the journey he kept an average height of about 7,500 ft. He crossed the Channel in 15 minutes, dropped to 2,000 ft. to pick up his bearings at Lympne, and completed his journey to Hounslow without misadventure *en route*, except for a slight *detour* made in error over Hendon.

Among the matter carried on the machine was an autograph letter from the King of Italy to King George, and letters to Mr. Lloyd George, Lord Derby, Mr. Balfour, Lord Montagu of Beaulieu, and the Lord Mayor of London, as well as current copies of the *Gazeta del Popolo*. Capt. Laureati



Sketch map of the route taken by Capt. the Marquis Laureati in his Turin-London non-stop flight.



**TURIN-LONDON NON-STOP FLIGHT.**—Capt. Laureati and his machine-gun mechanic, Michael Angelo Tonzo, who, leaving Turin on an S.I.A. machine on September 24th at 7.28 a.m. Greenwich time, arrived at the Hounslow Aerodrome at 2.50 p.m. the same day, without a stop, a distance of 656½ miles.

(Greenwich time) and followed the railway to Susa on the Italian frontier. Crossing the Alps by the Mont Cenis at an altitude of nearly 12,000 ft., he passed over Lanslebourg and rejoined the railway at Modane. During the crossing of the Alps, which took 1 hr. 40 mins., instead of the 50 mins. as originally planned, he encountered rough weather, and throughout the whole of the journey he had to face a strong north-westerly wind. The maximum altitude in passing over the Alps was 11,700 feet.

From Modane, still following the railway, a north-west course was shaped to Culoz, which was reached in 1 hour 40 min. from Turin. Continuing he passed over Verdun-sur-Doubs, crossed the Cote d'Or, and by way of Flavigny and Bussy, proceeded across the Seine and the Marne. Keeping to the east of Paris, his trip across France was completed by way of Compiègne, Amiens, and Cap Gris Nez. Throughout

was met on arrival by Admiral Mark Ker, on behalf of the Admiralty, Major Gerald Tharp, representing the War Office, and Major Stonor on behalf of the Air Board, Colonel Mola, Italian Military Attaché, Princess Potenziani, the Duke and Duchess of Mondragone, Marquess Theodoli, Baron Mayor des Planches (Italian High Commissioner), Prince Borghese, and other members of the Italian Embassy staff, and a number of Italian officers. Unfortunately when the machine landed at Hounslow, at 4 p.m., there was a slight mishap owing to the pilot having to pull the machine up suddenly to avoid the crowd. Neither of the occupants was hurt and the pilot was honoured by being carried shoulder high by Italian and British officers.

Capt. Laureati received a congratulatory message from the King and one from Viscount French. During his stay in London he is being entertained at luncheon by the Air Board.

### The Italian Cross-Country Record.

SOME figures are now available regarding the flight of Capt. the Marquis Laureati from Turin to Naples and back. It appears that the total time was 10 hrs. 10 mins., the outward journey of 480 miles from Turin, *via* Rome, taking 4½ hours, while on the return journey, which by a detour was lengthened to 518 miles, the time was 5 hours 40 minutes against a strong wind.

### Captain Guynemer Missing.

CAPTAIN GUYNER, the famous French pilot, has been missing since September 11th, and it is much feared that the

ultimate news may be worse than "missing." While making a reconnaissance over the Flanders front, in giving chase to some enemy planes he got separated from a companion machine and has not been seen since. Captain Guynemer headed the list of French "aces," having 53 German machines to his credit.

### Mr. Bonar Law's Son Missing.

It is with great regret that we learn that Capt. J. K. Law, R.F.C., the eldest son of Mr. Bonar Law, the Chancellor of the Exchequer, is reported missing. He was wounded in July, 1916, but the wound was not serious.

## AIRISMS FROM THE FOUR WINDS.

It is to be hoped that the reduction in U-boat victims, which has been a note in the latest official reports, may be maintained and even brought to narrower limits. There is little doubt that this *can* be achieved by still further use of aircraft in "spotting" these under-sea prowlers. After all, most of the aggressive plans and devices of the warring nations have been conceived and thought out before the advent of the aeroplane, and therefore are in most instances liable to complete upset in their calculations by the taking advantage to the full of the third element. And it is again, therefore, aircraft in quantities to which one must look more and more to overcome the U-pirate. Of course, the outstanding trouble here once more is the many and insistent calls upon the output of machines and the difficulty of holding the scales of discretion at balance in apportioning that output to the most vital and urgent necessities of the moment. The material supplies for this country are pretty important, and without doubt the Aerial Patrol looking after the submarines, both in home waters and far afield, is hardly likely to be starved unnecessarily. An American note upon this subject struck in *Collier's Weekly* is therefore the more interesting, in which an authoritative writer draws the conclusion that "the real end of the submarines will come with the widespread introduction of the bombing plane."

A Sign of the Times.—Ten pilots who have been trained in New South Wales at the State Aviation School at Richmond, have been accepted by the War Office. They will be commissioned by the Defence Department as 2nd Lieutenants in the Infantry, A.I.F., and not allotted to any unit. If, after training in England, they are found suitable, they will be posted to the R.F.C. If not considered suitable as pilots, they will be available for service as infantry. These will be the first men sent over by any State under these conditions, and their progress will be watched with interest, particularly the percentage whose State training qualifies them for immediate acceptance as R.F.C. pilots.

Does the removal of the head offices of a well-known aircraft firm—to wit, the Aircraft Supplies Co.—to Long Acre presage that the one-time centre of the carriage and motor industries is to take on a new lease of life as a rallying point for those concerned with the more modern means of locomotion, ousting the vegetable and fruit merchants, who for the time being are filling the automobile void brought about by the war?

It is good to see that definite endeavours are now being made to place engineering training on a sound basis. No effort should be spared to make the meeting arranged for October 25th at 3.30 p.m. at the Institution of Civil Engineers, Great George Street, Westminster, a complete success. Sir Maurice Fitzmaurice, C.M.G., is to take the chair, and the organisation is in the hands of that very keen worker, Mr. A. E. Berriman, Chief Engineer of the Daimler Co., and Mr. A. P. M. Fleming, of the British Westinghouse Co.

In reading a paragraph in the will of the late Sir Arthur Liberty, the founder and chairman of Liberty and Co., who left the nice little sum of close upon £350,000, it is very forcibly brought home to the thinking man, that nothing in the world could be more calculated to encourage wilful extravagance and discourage thrift throughout life, than the system of death dues taxation and other official "annexations" (in peace time, as in war) by Government of that "unearned increment" upon which so much taxation—just and otherwise—in other directions (when the boot is on the other leg) has been built up of late years. It's a one-sided game anyway, but it's a very plausible text which the nation's rulers are able to take full advantage of in pandering to the call of the "hates work and hates them as likes it" brigade, for the dividing up and re-dividing up and then re-dividing up again of everything that belongs to everybody else, until—well, where is the end of it all anyway? As the late Sir Arthur testifies in his will, "I have not given any legacies



MORE IRON CROSSES.—The Kaiser decorating officers on the western front.

to charitable institutions, as I consider that during my life and at my death the State will appropriate an undue proportion of my estate, which has been acquired by personal effort and thrift."

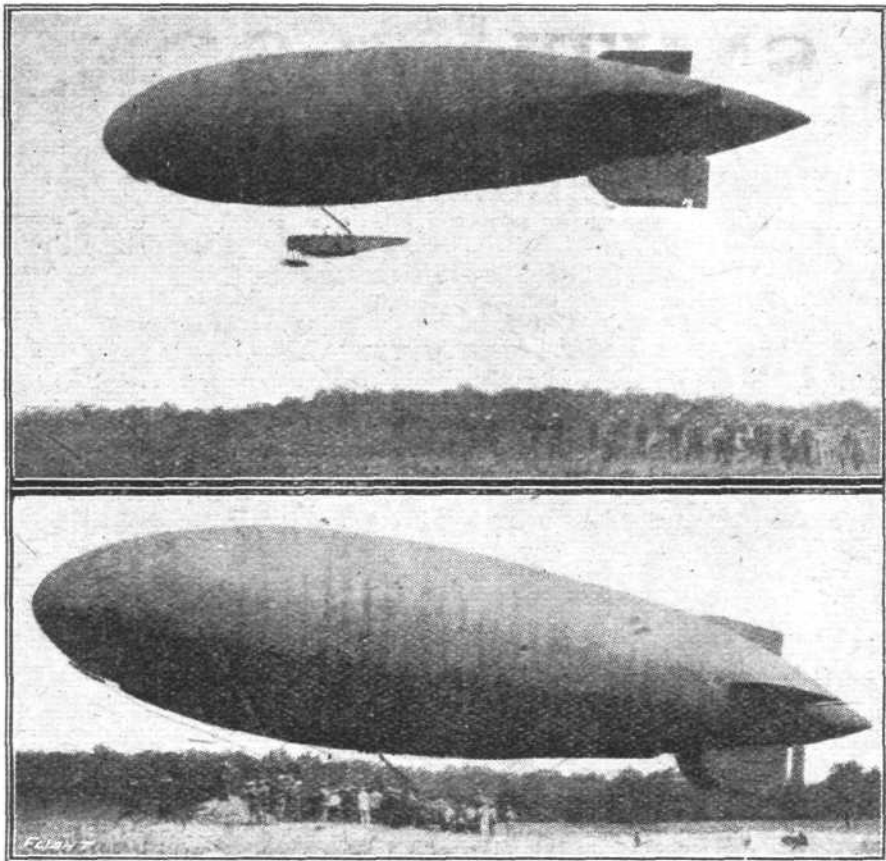
THAT complaint of the individual in the parable of old, "I feared thee because thou art an austere man: thou takest up that thou layedst not down, and reapest that thou didst not sow," has evidently been laid well to heart and adopted as a motto by past Chancellors of the Exchequer.

At a North London police court last week, a quaint quandary arose in connection with an air raid. The Metropolitan Water Board claimed to recover from an occupier a quarter's water rent in respect of a house rendered uninhabitable during an air raid. The collector produced a Statute under which it appeared that the occupier was liable. But poor comfort was forthcoming from the magistrate in giving the defendant an opportunity of settling with his oppressors. It would strike most people that, under the new circumstances brought about by war in the air, the sooner that Statute relied upon by the astute collector is quashed the better for British justice.

A MESSAGE was last week dropped at Stevenage, Herts, from a passing aeroplane, and the weight that brought it to earth hit the fire station, dislodging some tiles. It's a good job the Gotha crowd are not so expert in strafing official buildings.

A GOOD suggestion likely to lead to many practical additions to the cause of the National War Museum is, that an interim exhibition of part of the war trophies already in the possession of the War Memorial Committee should be inaugurated. A similar "show" organised early this year by our French Allies was an outstanding success, and it is felt that such an exhibition, while by no means complete, would have an excellent effect both on the British public and the large body of neutrals who are living in this country. In this connection large "dumps" of exhibits were recently inspected in France by Sir Alfred Mond, and it is understood that a special effort is to be made to bring over some of them at an early date. Among recent additions to the collection in Great George Street are the Union Jack which was saluted by the Greek troops in expiation of the murder of British naval officers, and the visitors' book of the Imperial yacht "Germania." On the flyleaf of the latter is the signature of the Kaiser in characteristically large letters.

THE "Take Cover" directions recently issued by the Commissioner for the guidance of the police and for general information are about the most sensible addition to raid literature so far published. The advice given is in the very simplest phraseology, and anybody who gets mauled by



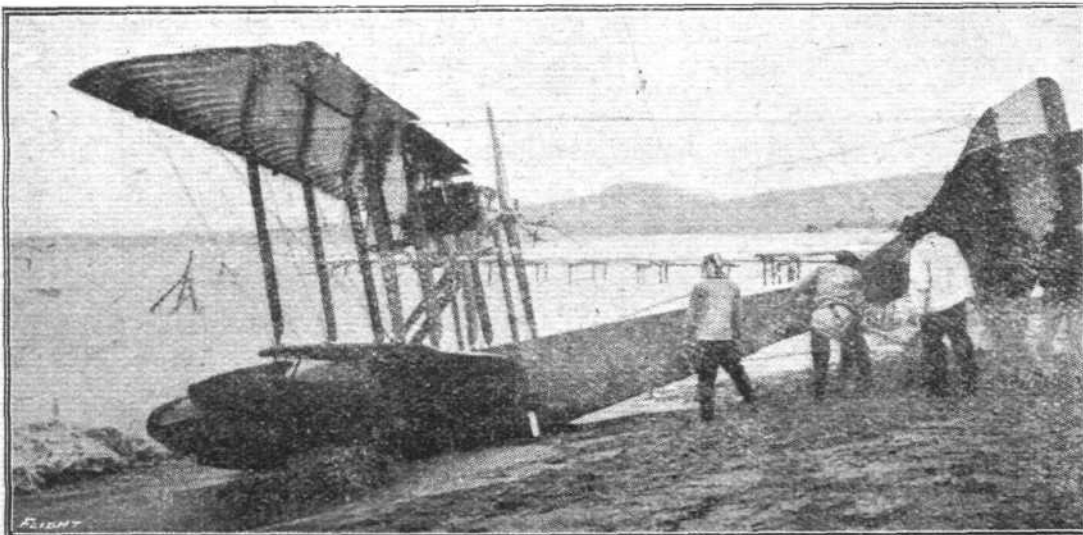
By courtesy "Aerial Age". (U.S.A.).

The first of the U.S.A. Navy "Blimps," constructed by the Goodyear Co., making its trial flights.

falling shrapnel, &c., when by following these hints injury can in most cases be avoided, about deserve what they get. The full text is reproduced in our current issue.

A NEW note from the *Daily Chronicle* "Office Window": The correspondent of *Musical News*, who points out that Gotha aeroplanes "drone" on the note A flat, while our own machines prefer E and F, has surely overlooked an important point when he suggests that anyone with the sense of absolute pitch should have no difficulty in identifying hostile raiders by their sound. The pitch of a sound depends on the number of vibrations reaching the ear in a given time, and the number varies according as to whether the source of the sound is moving towards or away from the listener. Given a Gotha hustling at 100 miles an hour, its A flat could vary as much as a perfect fourth, which is more than the difference between it and the British machines' E or F.

If an express train sounds its whistle while approaching and passing through a station, the pitch of the whistle—though actually the same all the time—will appear to rise as the train comes into the station and fall as it passes out. In



By courtesy "Aerial Age" (U.S.A.).

An Italian Navy F.B.A. flying boat.

the first case, the sound waves reach the ear more frequently, as the source is approaching, and in the second less frequently as the source is retreating. It would be the same with the Gotha's A flat—if it is always that note, whatever the speed of the machine, which is highly improbable.

DURING his recent tour of the great munition and other works up North, the King took the opportunity of laying the foundation stone of an important new extension to the works of Messrs. William Beardmore and Co., Ltd.

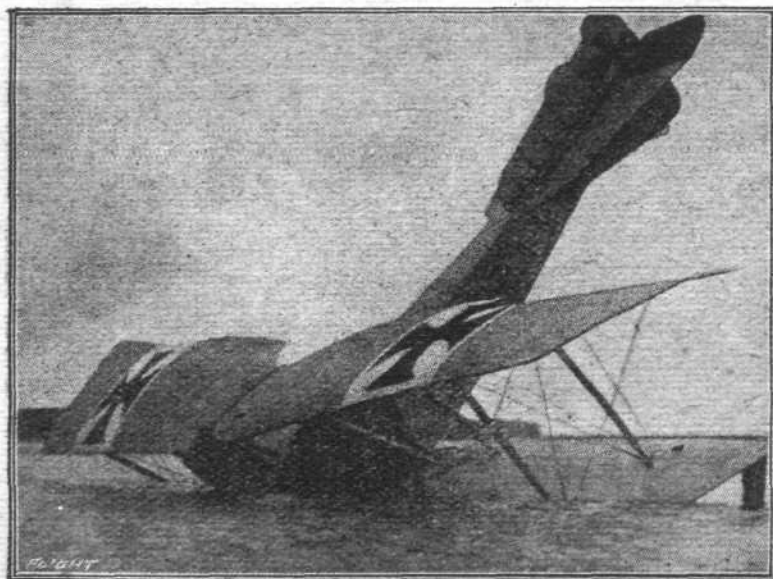
It would be intensely interesting if one were able to get at the average view of the German public upon the effect of the night air-raids in which London—according to Hun "Woolfisms"—has been for the past three years, and still is, being wiped out, annihilated and done for regularly, about twice a week. The following very true and unimpassioned *résumé* in the *Times* of Tuesday last upon the effect of the visit to London of the Gotha bombers on the Monday night, may help the Huns at home to arrive at a well-balanced judgment as to the worthiness of the whole business, especially in view of the possibilities presently of return visits by our Flying Services to, as Mr. Joynson-Hicks, M.P. suggests, "lay Cologne flat." A few more interesting points may easily with advantage be included in the list, and we shall then look forward to producing, by way of contrast, the description of the effects upon the enemy's public, as set forth by such reflections of the populace's views, as the *Cologne Gazette*, &c. It may come yet and before many more moons have passed. The *Times'* well-balanced report is as follows:—

"The attack was one of the most resolute which has ever been directed against London. Star shells were frequently employed in order to assist the searchlights, but save in rare instances the raiders remained undetected. The noise of aerial torpedoes could be plainly heard, and the explosions caused by some of the missiles were deafening. There was little panic or confusion, and those who preferred to be spectators viewed the visitation with equanimity.

"Soon after 8 o'clock the majority of people in the West End of London knew that a raid was taking place, and people everywhere hurried to the tubes or to any other shelter near at hand. The warning reached the restaurants rather later, but caused very little excitement. People who were at dinner went on with their meal, and showed their interest only by asking waiters if they had any news of what was happening.

"The tube stations were crowded with men, women, and children for fully two hours. There were hardly any signs of panic. Platforms and corridors were thronged, and women sat with their babies on the stairways, but they sat quietly and showed no fear. Newsboys who moved among the people told them that they would be able to read all about the raid in the papers next morning.

"The crowds were particularly dense at Piccadilly Circus, Oxford Circus and Charing Cross. Some of the refugees, after sheltering for a time, were inclined to go up into the streets again, but as shrapnel was falling in the streets special constables advised them to stay below.



THE MERCEDES HAS A COLD BATH.—A German seaplane after a rough "landing."

"Generally speaking, not many people stayed in the open while the raid was in progress. Those who did saw a sky criss-crossed with searchlights and heard the sound of many guns. Some declared that they heard the sound of aircraft overhead, but whether of our own flying forces or those of the enemy they could not be sure. People in the suburbs had a good view of the raid and of the defensive measures taken. It was a still clear night, and a moon swelling towards the full had suggested the possibility of an enemy attack. Nobody seems actually to have caught a glimpse of the raiding machines."

## TEN YEARS AGO.

Excerpts from the "Auto." ("FLIGHT's" precursor and sister journal) of September, 1907. "FLIGHT" was founded in 1908.

### THE BRITISH ARMY AEROPLANE.

Very serious preparations for the construction of an aeroplane are going on apace in the wilds of Scotland. At Glen Tilt, on the estates of the Duke of Atholl, there is an exceedingly remote encampment of the British Army busily engaged in erecting their machine while safe from prying eyes. It is an ideally secluded spot, which few could find unassisted, and, needless to say, none are allowed to approach; moreover when the work is finished, which may be in less than a month's time, the surroundings will provide a perfect testing ground. It is suggested that the King, when he goes to Ballater, may pay a visit to this little encampment, where Lieut. Westland, Mr. W. Dunne, and a few others are so busily engaged, and if so, he will again demonstrate the keen interest he always has taken in any scientific development calculated to increase the efficiency either of his Navy or Army.

### THE PARSEVAL AIRSHIP.

During practically the whole of Saturday last Major von Parseval, who is such a keen worker among the organisers of the German Society for the study of Aerial Navigation, gave a public demonstration with his airship in the experimental grounds at Tegel. Many prominent personages were invited, and several hundred people applied for permission to make ascents, although on this, the first occasion, it was only possible to take up a few of the more notable guests, among whom were General von Einem, Minister of War, and General von Moltke, of the General Staff.

Two passengers were carried at each ascent in addition to Capt. von Kehler and the two engineers.

### THE "VILLE DE PARIS."

Success continues to attend the efforts of M. Deutsch de la Meurthe, whose airship the "Ville de Paris," now that it has been repaired, seems to take very kindly indeed to its natural element. Recently it went up for slightly more than an hour, and is reported to have attained a speed of 40 kilometres per hour during the course of the test; MM. Henri Kapferer and Paulhan were on the board.

### MR. WELLMAN MAKES AN ASCENT.

As a grand finale to his "season" at Spitzbergen, Mr. Wellman actually made an ascent in his airship "America." However serious it may have been as a start for the Pole, it must have been far more exciting than any of those who took part anticipated or probably desired; for after being towed by a steamer towards Vogel Bay Island it was finally cut loose, and Mr. Wellman, Mr. F. Riesenbergh (the aeronaut) and Mr. Vaniman (the engineer) forthwith proceeded to make their way home alone. About this time however, the wind, which had been giving them so much trouble during the preliminary operations, once more began to exert itself, and the airship "America" was driven ignominiously before it, until a hasty descent landed the whole apparatus as an inert mass on a glacier.

### AEROPLANE TRIALS AT ISSY.

Both M. Blériot and M. Henri Farman are exceedingly busy with their aeroplanes at Issy, where they are conducting their trials. M. Blériot practices incessantly, and has made little flights of from 100 to 200 metres repeatedly, and for the most part has been successful in landing in a most satisfactory manner.

### THE BREGUET HELICOPTER.

Another experiment recently carried out at Issy was conducted with a Helicopter devised by Messrs. Breguet and Richet—well-known names in the circles of science and medicine in France. The apparatus consists of four propellers in a nearly horizontal plane driven by a 40 h.p. engine, and as the framework was incomplete, an armchair was harnessed up for trial purposes. Although weighing about half a ton it is stated that the machine lifted itself and the aeronaut easily into the air—"four men being required to hold it down."



### Casualties.

Captain WYNDHAM WATERHOUSE FITZHERBERT, Royal Sussex Regiment, attached R.F.C., who was killed on July 7th, aged 25, was the third son of the late W. A. Fitzherbert, Marsden, The Hutt, Wellington, New Zealand, and Mrs. Fitzherbert, and grandson of the late Sir William Fitzherbert, K.C.M.G. He was born in New Zealand and educated at Huntley School, Marton, Wanganui College, and afterwards at Marlborough College, England. He returned to New Zealand, and afterwards went to the Argentine to take up farming. When war broke out he (and his youngest brother, who was killed on July 30th, 1916) came over from the Argentine and enlisted in the 12th Royal Sussex Regiment, but shortly afterwards was given a commission in another battalion of that regiment. While in training, before going to France, he passed a musketry course and a machine-gun course with distinction. He went out to France in March, 1916, and was twice wounded, the second time in June of that year, when he returned to England to hospital. In December he rejoined his regiment at the front, and was there till the following May, when he joined the Royal Flying Corps, and went back to the front in June. He was killed when returning from a long-distance bombing raid.

Captain ALEX. JENNINGS, R.A., Flight-Commander, R.F.C., reported missing on April 7th last, is now known to have been killed in aerial fighting on that day. Born in 1894, he was the only son of Mr. and Mrs. W. J. Jennings, of Kennington Hall, near Ashford, Kent, and was educated at Yardley Court, Tonbridge, Tonbridge School, and at Zurich, being at Zurich when war broke out. At the earliest opportunity he returned home, and entered the Royal Military Academy, Woolwich, in December, 1914, passing out in July, 1915, and being posted to a battery of the Royal Horse Artillery. Shortly after obtaining his commission, he was sent to Gallipoli, where he was slightly wounded. He was invalided to Alexandria with a severe attack of typhoid shortly before the evacuation. He returned to England early in 1916, and while on sick leave obtained the Royal Aero Club's qualification for flying, with the intention of immediately joining the R.F.C. In May, however, he was sent to a battery at the Front, and served with it till he was attached to the R.F.C. in July, when he returned home to train. He obtained his wings in October, and proceeded at once to a squadron at the Front.

Second Lieutenant FRANK MARSHALL-LEWIS, R.F.C., formerly of the Royal Warwickshire Regiment, who was killed whilst flying at the front on the 13th September, was the son of Mrs. Harry Lewis and stepson of Mr. Harry Lewis, of 9, Norland Square, Holland Park, W. 11. He was educated at Clephanes College, Great Portland Street, and was in his 20th year. Joining the Civil Service Rifles in November, 1914, he obtained his commission in June, 1915. He had been on active service in France since August 16th, 1916, and saw much fighting. Joining the R.F.C. last March, he went to the front as an observer in the following May.

Captain ARTHUR TRAHERNE RICKARDS, R.G.A., attached R.F.C., who was killed on September 13th, aged 24, was the only son of Mr. and Mrs. F. T. Rickards, of 25, Corfton Road, Ealing. He was born in Bombay in 1892, and was educated at Marlborough College and the Central Technical College, Kensington, finishing his engineering training at the McGill University, Montreal. On the outbreak of war he volunteered for service, and returning to England entered Woolwich, and received his commission in the R.G.A. on April 22nd, 1915. Shortly afterwards he proceeded to the front. In January, 1916, he was appointed observer for artillery in the R.F.C., which post he held till the following October, when he returned to England to train as a pilot. He was mentioned in dispatches on November 13th, 1916. He obtained his wings in April, 1917, and returned to the front in May. On July 12th he was made flight commander and captain, R.F.C.

Second Lieutenant HENRY JOSEPH WATLINGTON, R.F.C., who was reported missing on July 6th, and is now unofficially

reported killed on that date, while engaged on a photographic reconnaissance, was the eldest son of Mr. Henry William Watlington, M.C.P., and Mrs. Watlington, of Bermuda, and was 21 years of age. He was educated at Upper Canada College, Toronto. He enlisted in the Bermuda Volunteer Rifle Corps in September, 1914, and was twice wounded while serving with them in France in 1915. After five months in hospital in England he trained for a commission in the R.F.C., and was gazetted last March. He was married in July, 1916, to Isabel, daughter of Mr. Harrington Emerson and Mrs. Emerson, of New York.

Mr. F. E. Wear, of Myddleton Road, Bowes Park, N., has received intimation of the death in action of his son, Second Lieutenant ALBERT WEAR, of the R.F.C. After being educated at the Stationers' School, he entered the office of a chartered accountant, and joined the Royal Fusiliers soon after war was declared. After service in France he volunteered for the Flying Corps, and was accepted. He was killed last week whilst returning from a flight over the enemy lines.

Squadron-Commander AYLMER FITZWARINE BETTINGTON, R.N.A.S., aged 22, who was killed while flying at Eastchurch on September 12th, was the youngest son of Colonel and Mrs. Bettington, of Johannesburg.

Second Lieutenant FREDERICK MAXWELL HAWES, R.G.A., attached R.F.C., second son of the Rev. F. W. Hawes and Mrs. Hawes, of Stapleford Vicarage, Cambridge, who lost his life in an aeroplane accident on September 14th, was born in 1899, and educated at Marlborough College, of which he was a foundation scholar. He proceeded to the Royal Academy, Woolwich, in June, 1916, and was gazetted second lieutenant, R.G.A., last February. In the following April he became attached to the R.F.C., in which he soon qualified as pilot, though only 18 years of age.

Second Lieutenant WILLIAM SAMUEL HUDSON PALMER, whose death in an aeroplane accident is reported, was the only son of Councillor Palmer, of Dalkeith, Latchmere Road, Kingston-on-Thames, and was in his 21st year. He was educated at Hampton Grammar School and Finsbury College, where he gained his qualifying certificate as an electrical engineer. He enlisted as soon as he was 18 years of age in the Artists Rifles, and served in France for some time before receiving his commission in the R.F.C.

### Married and to be Married.

The marriage of Mr. ARTHUR JAMES ANNANDALE, of the R.F.C., son of the late Mr. James Hunter Annandale, of Polton, Mid-Lothian, and Miss THEODORE LINDSAY CALDWELL, daughter of Colonel and Mrs. Caldwell, of York, at South Ascot Parish Church took place on September 18th, the R.F.C. being largely represented, both by officers and men. The Aircraft Concert Party formed the choir, Air-Mechanic Drake, the youngest Fellow of the Royal College of Organists, was at the organ, and Air-Mechanic Bailey sang Sydney Smith's *Ave Verum*.

The engagement is announced of Lieutenant R. EASTWOOD, the Essex Regiment, attached R.F.C., and FLOERNCE, only daughter of Lieutenant BESTIC, R.N.V.R., late of Sydney, Australia.

The marriage arranged between Major ERNEST LESLIE GOSSAGE, M.C., R.F.A. and R.F.C., eldest son of Colonel Gossage, V.D., and Mrs. Gossage, of Darin Court, Upton Heath, Cheshire, and EILEEN GLADYS, daughter of Brigadier-General O'BRIEN, C.B., and Mrs. O'Brien, of Buxted Rectory, Buxted, Sussex, will take place on October 5th at the Parish Church, Buxted, at 2.30.

The marriage of Captain G. H. HALL, R.F.C., and Miss M. G. WELLS-COLE, will take place at Lincoln on October 1st, leave permitting.

A marriage will take place quietly at St. Stephen's Church, Gloucester Road, S.W., on October 6th, at 2.30, between Captain R. E. C. KNIGHT-BRUCE, Royal Devon Yeomanry

and R.F.C., of The Sanctuary, Crediton, Devon, and EVELYN elder daughter of Mr. NEVILLE AVELING and of Mrs. NEVILLE AVELING, of St. Germans Hall, Norfolk.

**Item.**

Sir Bryan and Lady Leighton have received unofficial news that their son, Captain R. T. LEIGHTON, Yeomanry and R.F.C., who was reported missing on August 17th, is lying wounded in a base hospital in the German lines. Captain R. T. Leighton, who received his commission on leaving Eton in 1911, had served 18 months in France with his regiment, and was seconded to the R.F.C. last Christmas. He returned to France last July. His machine was shot down in an air fight near the German lines on August 17th.



## THE CONTROL OF CALCIUM CARBIDE.

The following Order was issued on September 26th:—

The Minister of Munitions in exercise of the powers conferred upon him by the Defence of the Realm Regulations and all other powers thereunto enabling him, hereby gives notice and orders as follows:—

1. He hereby takes possession as from the date hereof until further notice of all calcium carbide, now or hereafter situated in the United Kingdom, except the stocks of persons who do not own more than half a cwt.
2. If any person having control of any calcium carbide to which Clause 1 hereof applies, without the consent of the Minister of Munitions, sells, removes, or secretes it, or deals with it in any way contrary to any conditions imposed in any permit that may have been granted in respect thereof, he will be guilty of an offence against the Defence of the Realm Regulations.
3. No person shall, as from the date hereof, until further notice, buy, sell, or supply, except for the purpose of carrying out a contract in writing existing at the date hereof, enter into any transaction or negotiation in relation to the sale or purchase of calcium carbide situated outside the United Kingdom, except under and in accordance with the terms of

His only brother, Major J. B. T. Leighton, M.C., was killed in France last May.

Captain the Marquis GIULIO LAUREATI, who has just flown from Turin to London without a stop, was born at Grottamare (Marche) on July 11th, 1877, and began flying for pleasure in 1908. His enthusiasm has led him to fly practically every type of machine. He entered the Air Service of the Italian Army in 1911, and qualified as a pilot in 1912. In the present war he has specialised in bombing, and using a Caproni machine has taken part in twenty-five attacks on the Austrian lines. He wears the silver and bronze medals for military valour. He has made several long-distance flights, the most noteworthy one being the round trip from Turin to Naples and back, a non-stop run of 1,675 kilometres. He has flown three times over Fiume and once over Lubiana.

a permit issued under the authority of the Minister of Munitions.

4. No person shall, as from the date hereof until further notice, offer to sell, sell, supply or deliver any calcium carbide situated in the United Kingdom except under and in accordance with the terms of a permit issued under the authority of the Minister of Munitions.

5. All persons shall within seven days from the first day of each month commencing in the month of October, 1917, send in to the Controller of Non-Ferrous Materials Supply, AM2/H, Hotel Victoria, Northumberland Avenue, London, W.C. 2, monthly returns of: (a) All calcium carbide held by them on the last day of the preceding month; (b) all calcium carbide purchased or sold by them for future delivery and not yet delivered on such last day; (c) all calcium carbide delivered to them during the preceding month.

Notwithstanding the above, no return is required from any person where total stock of calcium carbide in hand and on order for future delivery to him has not at any time during the preceding month exceeded half a cwt.

6. All applications in reference to this Order shall be made to the Controller of Non-Ferrous Materials Supply, at the above address, and marked "Calcium Carbide."

## "X" AIRCRAFT RAIDS.

### "X" 74 Raid (September 24th).

THE following *communiqués* have been issued by the Field-Marshal Commanding-in-Chief Home Forces:—

"September 24th, 11.55 p.m.

"Hostile aeroplanes attacked the South-East Coast of England this evening. The raiders came in at different places in Kent and Essex, and a few of them followed the River Thames and attacked London. Bombs were dropped at several points, and so far the casualties reported amount to six killed and about 20 injured."

"September 25th.

"Latest reports concerning last night's aeroplane raid show that the group of raiders which approached London was driven off by anti-aircraft gun fire, only one or at most two machines penetrating the defences.

"The casualties in all the raided districts reported by the police up to the present are:—Killed, 15; injured, 70.

"Material damage is not great."

### German Version.

"Last night our aviators attacked England. Bombs were dropped on military buildings and warehouses in the heart of London, on Dover, Southend, Chatham, and Sheerness. Fires gave evidence of the effect. All our machines returned

undamaged. Dunkirk was also attacked with bombs. The enemy lost thirteen aeroplanes. First Lieutenant Schleich won his twenty-second and twenty-third aerial victories, and Lieutenant Wüsthoff his twenty-first."

NOTE.—With regard to the statement "The enemy lost thirteen aeroplanes," it is authoritatively stated that if it is meant to refer to the enemy raid on England the statement is entirely devoid of truth.

### "X" 74 Raid (September 24th).

THE following *communiqués* have been issued by the Field-Marshal Commanding-in-Chief Home Forces:—

"September 25th, 1.35 a.m.

"Hostile airships appeared off the Lincolnshire and Yorkshire coasts early this morning. The raid is still in progress, and details are not yet to hand."

"Later.

"Enemy airships crossed the Yorkshire and Lincolnshire coasts between midnight and 3 a.m., but there is no evidence of their having penetrated to any distance inland. They were driven off by gunfire from various defended localities which they attempted to approach. Bombs were dropped at one coast town, three women being slightly injured. Little material damage was caused."

### Air Raid Warnings.

For the guidance of the police force the Commissioner of Police has issued certain directions in the event of an air raid either by day or night. They take the following form:—

When the "Take cover" notice is given the public are advised, if in the streets, to get out of them; if in their homes, to remain there. During daylight hours there is no difficulty in securing shelter in a building, but it is essential that it should be in a building that affords the protection of an intervening wall or other similar obstruction of substance. An open area below ground level affords good protection against a bomb exploding in the street. All police stations will admit throughout the 24 hours to the full extent of their accommodation persons seeking shelter there. During the hours when they are open, the public in galleries, museums, public libraries, and other places of public resort will be allowed to remain on the premises till the raid is over.

The Tube and other railway stations, which provide secure shelter, will admit the public without charge, as long as the stations are open for traffic, and if already sheltered there, till the raid is over, and police arrangements have been made as far as practicable for the regulation of the persons congregating there. Elsewhere there are numerous other buildings affording good shelter which will be made available both day and night for the purpose. At all police stations there is a list of those premises considered suitable. The managers of premises affording shelter (particularly at night) are invited, upon the issue of the "Take cover" notice, to exhibit a placard with the inscription "Air Raid Shelter." They can obtain this printed inscription on application at the local police station, and should have it mounted on a board for exhibition. As the managers at night may not know of the issue of the "Take cover" notice, constables, special and regular, will as far as practicable be detailed to apprise them and assist in regulating the persons admitted.

# The British Air Service

"PER ARDUA AD ASTRA"

UNDER this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the LONDON GAZETTE, it is not repeated in this column.

## Royal Naval Air Service.

Admiralty, September 18th.  
G. J. W. Goodwin entered as Prob. Flight Officer (Temp.), seniority Sept. 15th.  
B. S. Cain granted temp. commission as Sub-Lieut. (R.N.V.R.), seniority Sept. 17th.

Admiralty, September 19th.  
Lieut. (Temp.) S. R. Lowcock promoted to Lieut.-Comdr. (Temp.), seniority Sept. 17th.  
Assistant Paymaster.—K. B. S. Greig graded as Prob. Flight Lieut., seniority Sept. 18th.

The following Prob. Flight Officers have been promoted to rank of Flight Sub-Lieut. (Temp.), seniority as stated: F. A. Norton; May. 29th. I. F. Sutherland and G. F. Hodson; June 7th. J. D. Guild; June 22nd. H. W. M. Cumming and T. H. Herriot; July 7th. H. Willis, E. A. Mossop and S. P. Colt; July 14th. K. F. Alford, H. J. L. Botterell and A. A. J. Quennel; July 22nd. N. S. Lott, W. M. Shoosmith, J. E. C. Hough, M. L. Cooper and W. L. Crundall; July 29th. A. R. McAfee and W. N. Fox; Aug. 7th. F. Benzie, L. A. Ashfield and K. F. Piper; Aug. 14th. S. A. Grant, C. C. Dagg, E. P. Coleman, E. A. B. Wimbush, C. P. Sheppard, H. Constant and W. H. Wilmot; Aug. 22nd. G. White, M. V. Kelly, S. Anderson, A. A. Ferguson, P. R. Crowe, J. A. Rudd and V. H. Littleboy; Aug. 29th.

H. V. Clark, C. W. Smith, L. J. Frost and H. R. W. Brown, all entered as Prob. Flight Officers, seniority respectively July 9th and 16th. Aug. 7th and 21st.

W. B. Cass entered as Prob. Ob. Officer (Temp.), seniority Sept. 29th.  
C. F. Ganard granted a temp. commission as Lieut. (R.N.V.R.), seniority Sept. 18th.

Admiralty, September 20th.  
Sig. (R.N.V.R.) G. J. Pilgrim entered as Prob. Flight Officer (Temp.), seniority Sept. 19th.

C.P.O. R. W. A. Ivermee entered as Prob. Flight Officer (Temp.), seniority Sept. 19th.

A.B. (R.N.V.R.) N. E. Aronson entered as Prob. Flight Officer (Temp.), seniority Sept. 18th.

Admiralty, September 22nd.  
Probationary Flight Officer. (Temp.)—W. S. Patterson, granted a temp. commission as Sub-Lieut. (R.N.V.R.), seniority Sept. 21st.

The undermentioned have been entered as Prob. Flight Officers (Temp.), seniority as stated:—J. A. Smith, D. A. Colquhoun, W. E. Cowan, S. A. Dawson, R. B. Wilby, R. A. A. Graham, and T. H. Holmes, Sept. 2nd, 9th, 13th, 13th, 16th, 16th and 24th respectively.

Temp. commissions (R.N.V.R.) have been granted, seniority as stated:—Lieuts.—S. Brew, Sept. 17th; and N. F. Bayliss, Sept. 21st. Sub-Lieut W. D. Rhys, Sept. 20th.

Admiralty, September 24th.  
Flight Sub-Lieutenant (Temp.)—E. McD. Wright, promoted to Flight-Lieut. (Temp.), seniority Sept. 21st.

Probationary Flight-Officers (Temp.)—W. H. Scott and M. H. Press, both transferred to rank of Proby. Observer Officer, seniority respectively May 20th and June 10th.

Sub-Lieutenant (Temp.)—G. S. Boston, promoted to Lieut., R.N.V.R. (Temp.), seniority Sept. 21st.

The following have been entered as Proby. Flight-Officers (Temp.), seniority as stated:—C. W. Murphy; Sept. 9th. S. J. Bolitho, J. N. Bittton, D. L. Brocklesby, T. E. W. Browne, G. C. Bull, C. T. F. Chamberlain, E. Colmer, D. Y. Dobson, D. E. Culver, V. F. Dorey, R. C. Emmett, R. P. Francis, R. McI. Gordon, P. A. H. Lalouette, V. Lockney, F. B. Mason, A. H. Matthews, H. E. R. Nelson, W. G. Penney, H. C. Petch, W. G. Poulton, P. S. Primrose, G. B. Ränge, O. M. D. Rochs, T. D. E. Salmond, W. A. Spranklin, J. H. Sprott, G. H. Treadwell, J. M. Wilson, and R. A. Yates, all Sept. 16th; and W. G. Gwatkin, Sept. 20th.

## Royal Flying Corps (Military Wing).

London Gazette Supplement, September 18th.

The following appointments are made:—  
Squadron Commander.—Lieut. (Temp. Capt.) A. C. Wright, S.R., from a Flight-Comdr., and to be Temp. Major whilst so employed; Aug. 27th.

Flying Officers.—Temp. Lieut. G. F. C. Rawlings, Gen. List; June 30th, from a Flying Officer (Ob.), seniority Mar. 26th, 1916. Temp. 2nd Lieut. (on prob.) C. C. Hendershot, Gen. List, and to be confirmed in his rank; Aug. 20th. Lieut. A. W. Nasmyth, Can. Gen. List, from a Flying Officer (Ob.); Aug. 26th, seniority Dec. 2nd. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank: E. T. Simpson, B. Starfield; Aug. 27th. 2nd Lieut. J. K. B. Dreaper, N. Lanc. R., and to be sec'd.; Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank: N. Braithwaite, H. D. Roe, L. E. Gawthorne; Aug. 26th. F. V. Bird; Aug. 30th. C. G. Halliday; Aug. 31st.

Flying Officers (Observers).—2nd Lieut. J. H. McCann, E. York. R. (T.F.), seniority May 17th, and to be sec'd.; Temp. Capt. R. E. Rumsey, Welsh R., seniority May 17th, and to be transfd. to R.F.C., Gen. List; Aug. 29th. Temp. 2nd Lieut. M. Lawson-Williams, K.O. Sco. Bord., seniority Nov. 12th, and to be transfd. to R.F.C., Gen. List; Temp. 2nd Lieut. T. R. Scott, E. York. R., seniority May 5th, and to be transfd. to R.F.C., Gen. List; Lieut. H. M. Thomas, Can. Inf., seniority May 6th; Temp. 2nd Lieut. J. W. Ferguson, K.O. Sco. Bord., seniority June 27th; Lieut. F. C. Dickens, Can. Gen. List, seniority July 4th; Aug. 30th. Capt. J. Hirschberg, N. Zealand A.S.C.; July 28th, seniority July 4th. Temp. 2nd Lieut. H. W. Hamer, Lanc. Fus.; Aug. 11th, seniority July 16th, and to be transfd. to R.F.C., Gen. List. Temp. 2nd Lieut. B. C. R. Grimwood, R.F.A.; Aug. 15th, seniority July 16th, and to be transfd. to R.F.C., Gen. List. Temp. Lieut. W. Nuttall, Lanc. Fus.; Aug. 11th, seniority July 22nd, and to be transfd. to R.F.C., Gen. List. 2nd Lieut. J. MacDaniel, R. Dub. Fus., S.R.; Aug. 17th, seniority July 30th, and to be sec'd. Temp. 2nd Lieut. G. J. Bakewell, Gen. List; Aug. 19th, seniority July 30th. Temp. 2nd Lieut. J. H. R. Price, Wilts R.; Aug. 21st, seniority Aug. 15th, and to be transfd. to R.F.C., Gen. List.

Balloon Commander (graded as a Balloon Officer).—Capt. H. A. Page, S. Staff. R. (T.F.), from a Balloon Officer; June 12th.

Special Appointment (graded as a Park Commander).—Temp. Capt. T. E. Gilmore, Gen. List, from Examining Officer (graded as an Equipment Officer, 1st Cl., at a School of Mil. Aeronautics), and to be Temp. Major whilst so employed; Aug. 7th.

Equipment Officer, 3rd Class.—Qr.-Mr. and Hon. Lt. G. M. Nobbs, Essex R. (T.F.); Aug. 30th.

Supplementary to Regular Corps.—The following 2nd Lieuts. (on prob.) are confirmed in their rank: W. C. Sidaway, R. de L. Stedman, R. H. Little, R. B. Clark.

General List (R.F.C.).—The following Cadets to be Temp. 2nd Lieuts. (on prob.): D. S. Abernethy, A. M. Adam, K. V. Anderson, G. F. M. Apps, F. O. Bales, J. A. Barnes, J. Bowley, B. M. Bowyer-Smith, J. R. Bent, P. H. Brodziak, A. H. Burns, H. R. Caffyn, D. Cameron, A. Campbell, R. M. Campbell, A. F. V. Clark, D. Clark, C. H. Clarke, G. H. Clayton, V. Cleaver, A. E. I. Clifford, D. G. Cowan, C. L. Cox, J. Craig, R. H. Craig, R. C. Crowden, E. O. Cudmore, W. S. Dickson, R. J. G. Davis, D. Davis, H. W. Driver, V. U. Downard, D. Davidson, G. Davis, R. Douglas, R. Duncannon, B. A. Nevers, J. H. T. Davies, I. L. Edmunds, F. C. Edwards, F. E. B. Elsbury, S. H. B. Emmis, J. Erskine, J. R. Falck, H. M. Fletcher, J. H. Forbes, H. Ford, A. Fowler, R. I. Fowler, H. T. Foxton, C. L. Frank, W. E. French, E. O. Fuller, A. L. Garrett, R. Garbett, A. H. Galbraith, D. M. Galloway, L. C. Galloway, D. W. Geerds, J. M. Gibson, A. H. Giovanelti, W. L. Gopsill, D. L. Grahame, W. M. R. Gray, J. H. Greathead, L. A. Greenwood, C. J. Guthrie, C. F. Halford, W. G. Harrison, M. Helliwell, C. B. Henderson, H. F. Hendry, K. G. Hill, P. M. Hodder, G. C. Hope, P. Hotine, H. E. Honnissell, A. H. J. How, H. N. Jennings, F. Jickling, M. E. Jones, H. T. Joy, C. H. Kincaid, A. J. C. King, W. W. Langdon, C. L. Lindberg, E. W. Lindeberg, A. K. Lomax, F. McChesney, E. R. MacDonald, J. A. McGregor, A. A. Mackay, H. N. McLeven-Roberts, D. D. McQuat, H. Macpherson, C. E. Morgan, T. W. Mansell, R. S. Martin, W. S. Maxwell, W. May, G. G. Midgley, D. J. M. Miller, F. D. Miller, O. E. Miller, W. J. O. Millett, P. D. S. Milnes, E. P. Morgan, R. D. Muir, W. Munn, G. L. Murray, R. Neall, A. D. Neish, J. Nicolson, E. E. Page, C. Parry, J. H. Paton, W. J. Paull, F. R. Pearce, G. F. Peirce, W. H. Pickup, G. Pilditch, S. R. Pinder, J. Pipe, W. N. Porritt, A. R. Porter, L. G. Pindeaux, W. a B. Probert, R. H. Prynn, F. Pyle, A. G. Quinnell, S. R. Randall, L. Randles, A. P. Rapson, A. E. Reed, J. D. Reid, T. F. Rigby, A. P. Ritchie, R. E. Robb, D. A. Robertson, W. S. Robertson, G. D. Robin, H. S. Robinson, T. H. Robinson, C. G. Ross, M. A. Rowat, A. W. Rowdon, H. Saville, H. D. Schoeman, R. J. Scott, F. A. L. Sear, C. H. Sharp, J. E. Sharp, M. Sheriff, E. J. Smith, N. R. Smuts, A. P. Smelling, L. W. Stacey, G. F. Steel, W. M. Strathearn, L. L. K. Straw, C. Stuart, J. G. Sutton, V. S. Sweetnam, S. R. Swift, H. H. Tait, W. V. Theron, J. F. Thompson, R. Thomson, R. E. Townshend, C. A. Umbers, C. L. V. der Hoff, J. P. V. Ryneveld, C. J. Venter, K. H. Wallace, H. A. Walters, G. W. Wareing, F. H. A. Weale, E. C. White, G. L. Wilcocks, T. M. Williams, C. C. Wood, G. H. Wood, G. N. Wood, E. F. Wright; Aug. 30th.

T. B. Alexander, E. O. Amm, T. H. M. Brown, G. S. Bragg, W. Beer, F. H. Blaxhill, F. C. Barlow, W. M. Carlaw, J. W. Coggs, C. R. Chapman, S. T. B. Cripps, O. C. Cassels, R. Calrow, C. G. Causton, A. J. Coleman, J. A. Cogan, H. A. Clarke, T. E. David, J. E. F. Dell, W. H. T. Dancer, R. H. Dennis, N. J. Forbes, C. F. Fyfe, A. C. Fraser, A. Fleming, C. V. Frith, R. W. Gunner, E. M. Graddon, R. C. D'A. Gifford, C. E. W. Golding, J. H. Hewitt, J. P. Hamilton, T. R. V. Hill, G. S. Hodson, V. Hyatt, C. N. Haines, G. B. Hett, W. Hodge, C. M. Johnson, J. C. Kyd, R. J. H. Lane, C. J. L. Lester, B. Martin, W. K. Macfarlane, R. N. Maclean, F. L. Milner, H. McDonald, G. Randell, R. R. Rowe, L. B. Raymond, A. D. Stubbs, R. Stone, G. L. Smart, D. M. Scrimgeour, W. Scott, C. E. Thompson, W. V. Thomas, J. W. Thomson, H. C. Tomkinson, W. C. Tadjell, H. I. Williams, C. F. C. Wilson, J. M. Waterson, J. H. Wilkinson; Sept. 9th.

London Gazette Supplement, September 19th.

The following to be 2nd Lieuts. for service in the field:—  
R.F.C.—Acting Sergt.-Major E. Maynell; July 22nd.  
The following to be Temp. 2nd Lieuts.:—  
R.F.C.—Spr. J. V. Southon, from R.E.; June 30th. 1st Cl. Air-Mech. J. J. Williamson; July 27th.

The following appointments are made:—

Flight-Commanders.—From Flying Officers, and to be Temp. Capt. whilst so employed: Temp. Lieut. C. A. Brewster-Joske, Gen. List; June 18th. Lieut. D. S. Hall, Arg. and Suth'd. Highrs. (T.F.); Temp. 2nd Lieut. L. V. Thorowgood, Gen. List; Aug. 31st. Temp. Lieut. W. A. Wright, Gen. List; Temp. 2nd Lieut. N. Macmillan, Gen. List; Sept. 1st. Temp. 2nd Lieut. F. H. Bickerton, Gen. List; Sept. 3rd. Lieut. C. T. Lally, S.R.; Temp. 2nd Lieut. M. A. Hancock, M.G. Corps; Sept. 4th.

Flying Officers.—Temp. 2nd Lieut. (on prob.) F. W. Higgins, Gen. List, and to be confirmed in his rank, seniority April 5th, without pay prior to July 16th (substituted for the notification in the Gazette of Aug. 7th); Temp. 2nd Lieut. (on prob.) A. T. Glanville, Gen. List, and to be confirmed in his rank; Lieut. P. C. Hoyle, R.F.A., S.R.; Aug. 27th. Lieut. R. St. J. Hartley, Devon R., from a Flying Officer (Ob.), seniority July 9th, 1916; Aug. 28th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank: A. O. Lacy, G. S. Hankinson, H. N. S. Anderson, Lieut. C. B. Wainwright, R.A., from a Flying Officer (Ob.), seniority May 1st, 1916; Aug. 29th. Temp. 2nd Lieuts. (on prob.) Gen. List, and to be confirmed in their rank: W. H. Nash, J. R. Nickson; Lieut. H. Cook, Can. Inf.; Temp. Lieut. W. G. R. Bailes, attd. Arg. and Suth'd. Highrs., and to be transfd. to R.F.C., Gen. List; Aug. 30th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank: E. J. Alman, F. S. Clarke, J. W. Warner, W. A. Tyrrell, R. T. Goodyear.

Flying Officers (Observers).—Lieut. L. E. Porter, Can. Gen. List; April 22nd, seniority April 8th. 2nd Lieut. C. J. L. Harrison, Worc. R. (T.F.); July 27th, seniority June 11th, and to be sec'd. Temp. 2nd Lieut. H. K. Budgen, S. Wales Bord.; July 30th, seniority June 18th, and to be transfd. to R.F.C., Gen. List. Temp. 2nd Lieut. H. C. Douglas, R. Muns. F.; Aug. 1st, seniority June 18th, and to be transfd. to R.F.C., Gen. List. 2nd Lieut. H. H. G. Lamb, Conn. Rang., S.R.; Aug. 20th, seniority June 27th, and to be sec'd. 2nd Lieut. D. A. MacKerron, Arg. and Suth'd. Highrs. (T.F.); Aug. 9th, seniority July 18th, and to be sec'd. 2nd Lieut. H. F. Young, Notts and Derby R., S.R.; Aug. 19th, seniority Aug. 14th, and to be sec'd.

Adjutant.—Lieut. (Temp. Capt.) T. M. Eggar, Co. of Lond. R. (T.F.), from a Staff Officer, 2nd Cl. (graded as a Brigade Major), and to retain his temp. rank (without pay or allowances); Sept. 4th.

Equipment Officers, 2nd Class.—From the 3rd Cl.: Lieut. A. N. Greg, R. War. R. (T.F.); Lieut. F. M. Iredale, S.R.; Sept. 1st. And to be Temp. Lieuts. whilst so employed: Temp. 2nd Lieut. A. W. H. Phillips, Gen. List;

2nd Lieut. A. C. Blackmore, S.R.; 2nd Lieut. R. T. Royle, S.R.; Temp. 2nd Lieut. A. B. Wiggins, Gen. List; 2nd Lieut. R. H. Grant, S.R.

## School of Military Aeronautics.

**Commandants (graded as Wing Commanders).**—From Comdt. Staff Officers, 1st Cl., graded as A.A.G.s., and to retain their temp. rank whilst so employed: Major (Temp. Lieut.-Col.) I. M. Bonham-Carter, North'd. Fus.; Major (Temp. Lieut.-Col.) B. R. W. Beor, R.A.; July 6th. Capt. (Temp. Major) Lord A. R. Innes-Ker, D.S.O., Household Cav., from a Squadron Comdr., and to be Temp. Lieut.-Col. whilst so employed; Aug. 19th.

**Assistant Commandants (graded as Park Commanders).**—From Asst. Comdts. Staff Officers, 2nd Cl. (graded as Brigade Majors): Temp. Capt. F. A. Forde, Gen. List, and to be Temp. Major; from July 6th to 19th. Capt. C. S. McNab, Cam'n. Highrs., and to be Temp. Major whilst so employed; July 6th. Major P. E. L. Elgee, R. Berks. R., vice Temp. Major F. A. Forde, Gen. List; July 19th.

**Chief Instructor (graded as a Squadron Commander).**—Major G. B. Stopford, R.A., from a Squadron Comdr.; Aug. 19th.

**Instructor (graded as a Flight-Commander).**—2nd Lieut. (Temp. Capt.) W. C. Campbell, M.C., S.R. from a Flight-Comdr.; Aug. 19th.

**General List.**—W. M. Graham, to be Temp. 2nd Lieut.; Sept. 18th. To be Temp. 2nd Lieuts. (on prob.): Sergt. Leyster Nicholson, from M.G. Corps; Aug. 25th. Sqdn. Sergt.-Major W. H. Fearnside, from Yeo. (T.F.); Sept. 5th.

London Gazette Supplement, September 20th.

The following appointments are made:—

**Staff Officer, 2nd Class (graded as a Brigade Major).**—Lieut. (Temp. Capt.) W. O. Raikes, E. Kent R., S.R., from an Adj't., vice Lieut. (Temp. Capt.) T. M. Eggar, Lond. R. (T.F.), and to retain his temp. rank whilst so employed; Sept. 14th.

**Director of Aviation.**—Major (Temp. Lieut.-Col.) G. M. Griffith, R.A., from an Asst. Dir. of Aeronautics, and to be Temp. Col. whilst so employed; Sept. 1st.

**Flight-Commanders.**—From Flying Officers: Lieut. (Temp. Capt.) W. H. Williams, Lan. Fus. (T.F.); June 24th. And to be Temp. Capt. whilst so employed: 2nd Lieut. L. S. M. Page, Yeo. (T.F.); July 15th. 2nd Lieut. (Temp. Lieut.) T. Henderson, R.E. (T.F.); Sept. 1st. Capt. W. Smyth, Lond. R. (T.F.), from a Flying Officer; Sept. 4th. From Flying Officers, and to be Temp. Capt. whilst so employed: 2nd Lieut. J. M. Allport, S.R.; 2nd Lieut. (Temp. Lieut.) W. E. Kemp, R. Lanc. R., S.R.; Sept. 5th.

**Flying Officers.**—Temp. 2nd Lieut. (on prob.) T. R. Whitehead, Gen. List, and to be confirmed in his rank: Aug. 21st. Temp. Lieut. A. D. Roberts, M.C., Gen. List, from Flying Officer (Ob.), seniority Sept. 28th, 1916; 2nd Lieut. (Temp. Lieut.) L. Gellatly, Gord. Highrs., from Flying Officer (Ob.), seniority July 30th, 1916; Aug. 25th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank: E. J. Whyte; Aug. 25th. J. Creighton-Jones; Aug. 26th. R. H. Johnson; Aug. 29th. Temp. 2nd Lieut. W. H. Valentine, attd. K.O. Sec. Bord., and to be transf'd. to R.F.C., Gen. List; 2nd Lieut. C. P. Tiptaft, M.C., Conn. Rang., S.R., from a Flying Officer (Ob.), seniority Nov. 15th, 1916; Aug. 30th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank: F. B. Wilkins, J. D. de Pencier, J. D. Laing, R. Longman, I. McL. Black; 2nd Lieut. (Temp. Lieut.) E. W. C. G. de V., Viscount Glentworth, Yeo. (T.F.), from a Flying Officer (Ob.), seniority May 31st, 1916; Lieut. M. R. Taylor, Can. Gen. List; 2nd Lieut. F. R. Pender, R. Fus., S.R., and to be sec'd.; Aug. 31st.

Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank: E. H. Cutbill, C. B. Campbell, H. W. Querrie, G. Fox-Rule; Temp. Lieut. E. D. Jones, Gen. List, from a Flying Officer (Ob.), seniority from Nov. 23rd; Lieut. E. Gordon, Can. Inf.; Temp. 2nd Lieut. O. A. E. Allen, Gen. List, from a Flying Officer (Ob.), seniority Sept. 16th, 1916; 2nd Lieut. A. W. Prayer, S. Wales Bord., and to be sec'd. Temp. 2nd Lieuts. (on prob.) Gen. List, and to be confirmed in their rank: A. B. Paton, W. H. Foster, G. Pearson, W. Whitaker; Lieut. N. R. Mitchell, R. Scots, S.R., and to be sec'd.; 2nd Lieut. W. W. Hutton, Lond. R. (T.F.), and to be sec'd.; Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank: W. W. Frederickson, L. A. Palmer; Temp. 2nd Lieut. S. Taylor, E. Lan. R., and to be transf'd. to R.F.C., Gen. List. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank: E. T. Evans, F. H. Robinson; Temp. 2nd Lieut. W. M. Graham, Gen. List; Sept. 18th.

**Equipment Officers, 1st Class.**—Lieut. F. C. Buck, S.R., from the 3rd Cl., and to be Temp. Capt. whilst so employed; Sept. 1st.

**2nd Class.**—From the 3rd Cl.: Lieut. G. Purvis-Russell-Balfour-Kinnear, S.R.; July 5th. And to be Temp. Lieuts. whilst so employed: 2nd Lieut. F. J. H. Palmer, S.R.; Sept. 1st. Temp. 2nd Lieut. B. C. Akehurst, Gen. List; Sept. 6th.

**3rd Class.**—Temp. 2nd Lieut. H. M. Piper, Gen. List; Sept. 8th.

## School of Military Aeronautics.

**Instructor (graded as an Equipment Officer, 1st Class).**—Temp. Lieut. F. de B. Collette, Gen. List, from an Asst. Instr. (graded as an Equipment Officer, 2nd Cl.), and to be Temp. Capt. whilst so employed; Aug. 31st.

**General List.**—Temp. 2nd Lieut. W. A. M. Austin to be Temp. Lieut.; July 1st. To be Temp. 2nd Lieuts. (on prob.): C. L. Rayment; Sept. 1st. Sergt.-Major J. Pell, M.C., from R.F.C.; Sept. 2nd. To be Temp. 2nd Lieuts.: Sergt. D. M. Rawcliffe, from R.F.C.; Sept. 3rd. Sergt.-Major H. M. Piper, from R.F.C.; Sept. 8th.

**Supplementary to Regular Corps.**—2nd Lieut. D. A. McDougall relinquishes his commission on account of physical unsuitability as a Pilot or Ob.; Sept. 21st.

London Gazette Supplement, September 21st.

The following appointments are made:—

**Flying Officers.**—Temp. 2nd Lieuts. (on prob.) Gen. List, and to be confirmed in their rank:—H. M. Haines (not Haines, as in the Gazette of Sept. 6th); July 12th. W. Naylor; July 12th. A. Marriner, W. J. Morgan; July 18th. R. A. Davey; Aug. 2nd. R. Macdonald; Aug. 27th. D. H. Phillips; Aug. 29th. Temp. Lieut. G. W. T. Glasson, R.A., and to be transf'd. to R.F.C., Gen. List; 2nd Lieut. (on prob.) J. H. F. Hambly, S.R.; 2nd Lieut. C. B. Andrews, North'd. Fus., and to be sec'd.; Aug. 30th. Temp. 2nd Lieuts. (on prob.) Gen. List, and to be confirmed in their rank: H. W. Laird, R. D. Leffer; Aug. 31st.

**Equipment Officers, 3rd Class.**—Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—R. C. Carline; June 26th. L. E. S. G. Lord Garvagh; Aug. 30th.

**Special Appointment (graded as an Equipment Officer 2nd Class).**—The unit of 2nd Lieut. A. G. Saxty is Som. L.I. (T.F.), and not as in the Gazette of Aug. 25th.

**General List.**—J. B. Donald, late Capt., R. Mar. Submarine Miners, to be Temp. 2nd Lieut. (on prob.); Aug. 24th.

**Supplementary to Regular Corps.**—2nd Lieut. J. A. Raymond resigns his commission; Sept. 22nd. The Christian names of 2nd Lieut. (on prob.) William Frank Smith are as now described, and not as in Gazette of April 11th. 2nd Lieuts. (on prob.) are confirmed in their rank:—F. A. Trotter, G. A. Lush, A. H. Flower, A. C. Watson, A. C. Atkey, H. W. Collier.

London Gazette Supplement, September 22nd.

The following appointment is made:—

**Squadron Commander.**—Temp. Lieut. (Temp. Capt.) J. C. Russell, R.E., from a Flight Comdr., and to be made Temp. Maj. while so employed; Sept. 1st.

**Flight Commanders.**—From Flying Officers:—2nd Lieut. (Temp. Lieut.) E. G. E. Donaldson, R.F.A., S.R., and to be Temp. Capt. whilst so employed; Sept. 8th. Capt. F. H. Lawrence, Wore. R., S.R.; Sept. 9th. Lieut. R. M. Charley, S.R., and to be Temp. Capt. whilst so employed; Sept. 11th.

**Flying Officers.**—Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—D. C. Russell; Aug. 28th. J. E. Wood, A. L. Clark; Aug. 29th. 2nd Lieut. (on prob.) J. U. G. Lamond, S.R. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—J. L. McLintock, S. B. Cole, G. G. Edge, H. J. Bailey; Aug. 30th.

Capt. L. G. S. Reynolds, Lond. R. (T.F.), and to be sec'd. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—H. J. Welch, H. B. Hudson, E. D. Neal, J. N. Blacklock, J. Mackereth, B. R. Bertannes, A. G. McNeil; 2nd Lieut. G. G. Macphree, High. L.I. (T.F.), and to be sec'd. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—J. E. Phillips, T. C. Clifford, S. T. Liversedge, D. J. A. O'Brien, J. Sangster; Lieut. J. P. McRae, Canadian A.S.C.; Lieut. D. J. Nickle, Canadian Forestry Corps; 2nd Lieut. (on prob.) A. A. James, S.R. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—H. S. Wolff, A. J. Ballantyne, T. G. Jackson, F. B. H. Anderson. Capt. G. W. Taylor, Canadian Local Forces; Temp. 2nd Lieut. (on prob.) E. Collis, Gen. List, and to be confirmed in his rank; 2nd Lieut. F. Naylor, N. Lan. R., and to be sec'd. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—L. H. Whitfield, C. P. Dixon, J. W. D. Farrell, A. M. Kinnear, E. A. Coghlan, A. H. Hepworth, H. C. Lesse, H. E. Jones, R. O. Babbitt, C. E. Rider; Aug. 31st. J. E. G. Hassall; Sept. 1st. N. R. Joyce; Sept. 2nd.

Lieut. N. L. Sheppard, Canadian Inf., from a Flying Officer (Ob.) seniority from Sept. 18th, 1916; 2nd Lieut. K. H. Willard, York and Lanc. R., and to be sec'd. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—W. L. Head, C. J. Pool, G. B. Craig; Sept. 3rd. Temp. 2nd Lieut. J. Austin-Sparks, Gen. List; Sept. 8th.

The appointment of Temp. 2nd Lieut. W. A. McMichael, R. Scots, notified in Gazette of Aug. 8th, is antedated to June 21st.

**Flying Officers (Observers).**—Temp. 2nd Lieut. D. W. T. Fox, R. Ir. Rif. (Sept. 4th, seniority from July 4th, and to be transf'd. to R.F.C. Gen. List.) Temp. 2nd Lieut. (on prob.) W. C. McMurray, Gen. List; Sept. 3rd, seniority from July 16th, and to be confirmed in his rank. 2nd Lieut. C. M. Mortimer, R.F.A. (T.F.); Sept. 2nd, seniority from Aug. 6th, and to be sec'd.: the surname of 2nd Lieut. B. H. Morrison, Ind. Army, is as now described, and not Harrison, as in Gazette of Aug. 22nd.

**Assistant Instructors in Gunnery (graded as an Equipment Officer 2nd Class).**—Lieut. B. B. J. A. O'Donnell, M.C., R. War. R. (T.F.), from an Asst. Instr. in Gunnery (graded as an Equipment Officer, 3rd Cl.); Aug. 30th. Graded as Equipment Officers, 3rd Cl.—Temp. 2nd Lieut. (on prob.) H. G. Eggar, Gen. List, and to be confirmed in his rank; Sept. 5th. Temp. 2nd Lieut. W. Lienard, Gen. List; Sept. 22nd.

**Balloon Commander (graded as a Balloon Officer).**—2nd Lieut. (Temp. Lieut.) D. M. Hodgson, E. York R. (T.F.), from a Balloon Officer; Aug. 7th.

**Special Appointment (graded as an Equipment Officer, 2nd Class).**—Temp. 2nd Lieut. A. W. Smith, Gen. List, from an Equipment Officer, 3rd Cl., and to be Temp. Lieut. whilst so employed; Aug. 1st. (Substituted for the notification in the Gazette of Aug. 24th.)

**Equipment Officers, 1st Class.**—Temp. Capt. W. A. W. Hallam, Gen. List, from a Staff Capt. at the War Office; Aug. 27th. 2nd Cl.—From the 3rd Cl., and to be Temp. Lieuts. whilst so employed:—2nd Lieuts. H. R. Brutey and A. W. Grigsby, S.R.; Aug. 6th. Temp. Lieut. R. Cadman, Gen. List, from the 3rd Cl.; Aug. 7th. Temp. Lieut. M. L. Harp, Gen. List, from the 3rd Cl.; Sept. 14th. 3rd Cl.—Temp. 2nd Lieut. (on prob.) J. H. Lowry, Gen. List, and to be confirmed in his rank; Feb. 8th. 2nd Lieut. (on prob.) C. B. Charlewood, S.R.; April 22nd.

## Schools of Instruction—School of Military Aeronautics.

**Commandant (graded as a Squadron-Commander).**—Maj. B. F. Vernon-Harcourt, Welsh R., a Sqdn.-Comdr.; June 15th.

**Chief Instructor (graded as a Squadron-Commander).**—Lieut. (Temp. Capt.) H. F. Fisher, S.R., a Flight-Comdr., and to be Temp. Maj. whilst so employed; May 26th.

**Instructors (graded as a Flight-Commander).**—2nd Lieut. (Temp. Lieut.) L. M. Woodhouse, Yeo. (T.F.), a Flying Officer, and to be Temp. Capt. whilst so employed; Sept. 16th. Graded as an Equipment Officer, 1st Cl.—Temp. Lieut. R. Rainford, Gen. List, from an Asst. Instr. (graded as an Equipment Officer, 2nd Cl.), and to be Temp. Capt. whilst so employed; July 6th.

**Assistant Instructors (graded as Flying Officers).**—Temp. Lieut. A. D. Broughton, Gen. List, a Flying Officer; Temp. Lieut. R. J. G. Temple, Gen. List, a Flying Officer (Ob.); Temp. 2nd Lieut. F. J. Martel, Gen. List, a Flying Officer; May 26th. Graded as Equipment Officers, 2nd Cl.; July 6th:—2nd Lieut. (Temp. Lieut.) G. A. Scutt, Midd'x R. (T.F.), a Flying Officer (Ob.); 2nd Lieut. (Temp. Lieut.) E. E. Macartney, R.G.A., S.R., a Flying Officer (Ob.); 2nd Lieut. (Temp. Lieut.) P. C. Routley, Welsh R. (T.F.), a Flying Officer (Ob.). And to be Temp. Lieuts. whilst so employed:—Temp. 2nd Lieut. H. McG. Wood, Gen. List, an Equipment Officer, 3rd Cl.; and Lieut. A. Wombwell, Lanc. R., an Equipment Officer, 3rd Cl.; Lieut. F. S. Smith, S.R., an Equipment Officer, 3rd Cl.; Aug. 31st.

**General List.**—Temp. 2nd Lieut. C. C. Weaver resigns his commission: Temp. 2nd Lieut. J. A. Gurney resigns his commission on account of physical unsuitability as a Pilot or Observer; Sept. 23rd. To be Temp. 2nd Lieuts. (on prob.):—R. J. Rogers; Aug. 24th. C. R. Southey, late Lieut., S. Afr. Horse; Sept. 5th. A. M. Langdale, late Lieut., W. York. R.; Sept. 21st. Armourer Sgt.-Maj. H. W. Hire, from M.G. Corps; Sept. 22nd. Flight-Sgt. J. A. Sparks, from R.F.C., and to be Temp. 2nd Lieut.; Sept. 8th.

**Supplementary to Regular Corps.**—The following 2nd Lieuts. (on prob.) are confirmed in their rank: E. W. Percival, C. R. F. Wickenden.

**General List (R.F.C.).**—The undermentioned Cadets to be Temp. 2nd Lieuts. (on prob.); Aug. 30th:—A. E. R. Aldridge, H. Atkinson, F. T. Brasington, W. J. Chivers, C. W. Cook, C. R. Eck, J. C. Garratt L. Greatbach, H. Hirst, E. A. Howes, D. McEachran, W. E. McLean, R. A. Pendry, G. E. Playford, P. H. Redmayne, F. T. Russell, S. H. Spencer, A. C. Thornton, A. A. Webster, G. G. Wilby; Sept. 2nd. R. Lazzari, S. C. Mimmack, J. G. Schmolle, T. C. Story.

London Gazette Supplement, September 24th.

## Attached to Headquarters Units.

**Staff Captains.**—Lieut. H. French, W. York. R., S.R., from Adj't., R.F.C., and to be Temp. Capt. whilst so employed, vice Temp. Capt. A. Murray, Gen. List; Aug. 18th.

The following appointments are made:—

**Wing Commanders.**—From Squadron-Comdts., and to be Temp. Lieut.-Cols. while so employed:—Capt. (Temp. Maj.) T. A. E. Cairnes, D.S.O., D. Gds.; Sept. 8th. Capt. (Temp. Maj.) A. Ross-Hume, Sco. Rif.; Sept. 22nd.

**Flying Officers (Observers).**—2nd Lieut. W. Grossmith, R.A., seniority from June 18th, and to be sec'd. Temp. 2nd Lieut. E. C. L. Copner, Devon R., seniority from June 27th, and to be transf'd. to R.F.C., Gen. List; 2nd Lieut. D. Taylor, R.F.A., S.R., seniority from June 27th; Sept. 5th. Temp. 2nd Lieut. S. Cleobury, S. Staffs R., seniority from June 27th, and to be transf'd. to R.F.C. Gen. List; 2nd Lieut. (on prob.) H. E. Jones, S.R., seniority from June 27th; Temp. 2nd Lieut. (on prob.) A. F. Castle, Gen. List, and to be confirmed in his rank; Sept. 7th. seniority July 15th. 2nd Lieut. W. Smith, R. Sco. Fus.

(T.F.), from attd. N. Staffs R. (T.F.); Sept. 4th, seniority from July 17th, and to be seed.; Sept. 4th. Temp. 2nd Lieut. E. Wilson, S. Lan. R., seniority from Aug. 6th. Capt. J. A. Revill, Canadian Inf., seniority from Aug. 7th; Sept. 6th. 2nd Lieut. W. D. Stroud, R.F.A., S.R.; Sept. 7th, seniority from Aug. 15th.

**Adjutants.**—Lieut. F. A. M. Rawes, R.A., S.R., vice Lieut. M. Nicholson, R.F.A. (T.F.); July 9th. Temp. 2nd Lieut. R. C. Wansbrough, S. Staff R., and to be Temp. Capt. (with pay and allowances as Lieut.) while so employed, vice Lieut. H. French, W. Yorks R., S.R.; Aug. 18th. Capt. A. M. Wilson, Gord. Highrs. (T.F.), from a Flying Officer; Sept. 3rd. 2nd Lieut. J. T. Pym, E. Surr. R., S.R., to be Temp. Capt. (with pay and allowances as Lieut.) while so employed, and to be seed.; Sept. 11th.

**Equipment Officers, 2nd Class.**—Temp. Capt. C. T. Cleaver, M.C., Gen. List, from a Flying Officer (Ob.); Aug. 3rd. Lieut. E. A. Richards, S.R.; Sept. 5th.

**3rd Class.**—Temp. 2nd Lieut. H. Smith, Gen. List; July 12th. Temp. 2nd Lieut. E. O. Johnson, Essex R., and to be transfd. to R.F.C. Gen. List; July 13th. Temp. 2nd Lieut. G. K. Cathles, Gen. List, from a Balloon Officer; Aug. 1st. Temp. 2nd Lieut. O. W. de Putron, Durh. L.I., and to be transfd. to R.F.C., Gen. List; Aug. 13th. Temp. 2nd Lieut. (on prob.) J. W. Clark,

Gen. List, and to be confirmed in his rank; Sept. 6th. Temp. 2nd Lieut. P. V. Davies, Gen. List; Sept. 8th.

*Schools of Military Aeronautics.*

**Assistant Instructor (graded as an Equipment Officer, 2nd Class).**—Temp. 2nd Lieut. C. W. Duffield, Gen. List, a Flying Officer (Ob.), and to be Temp. Lieut. while so employed, vice Lieut. E. W. Vaughan, S.R.; Sept. 8th.

**General List.**—Temp. 2nd Lieut. F. A. Cobb to be Temp. Lieut.; Sept. 15th, 1916. The following resign their commissions:—Temp. 2nd Lieut. A. Ireland, Temp. 2nd Lieut. (on prob.) J. de C. Ballardie; Sept. 25th. To be Temp. 2nd Lieuts. (on prob.):—J. F. Lamonby, A. Campbell, J. H. Lytle, W. J. Hollis, C. Neville, W. E. Palmer, A. Bolton, W. Adam, J. E. Tyrrell, P. C. Thornton, F. V. Ruston, F. S. Stokes, A. J. Tutton, P. C. Smith, F. T. Holmes; Sept. 8th. G. B. Fielding, late Lieut., E. Kent R. (T.F.); Sept. 21st.

**Aeronautical Inspection Department.**

*London Gazette Supplement, September 21st.*

Temp. Hon. Lieut. E. J. Vallentine to be Temp. Hon. Capt. (without Army pay and allowances) whilst employed as Inspector, A.I.D.; Aug. 1st.



## AIRCRAFT WORK AT THE FRONT. OFFICIAL INFORMATION.

**British.**

*General Headquarters, September 18th.*

"In spite of low clouds and a very strong west wind a considerable amount of artillery work was carried out by us yesterday with aeroplane observation."

"Three hostile machines were driven down out of control in air fighting, but combats were few, owing to the small number of German machines in the air. Three of our aeroplanes are missing."

*General Headquarters, September 19th.*

"On the 18th inst. our aeroplanes continued to observe for our artillery in spite of most unfavourable weather conditions. One hostile machine was driven down out of control. Two of our machines are missing."

*General Headquarters, September 20th.*

"During the morning the weather cleared, and our aeroplanes were able to take a more active part in the battle, indicating the position of our troops, and reporting hostile concentration to our artillery. In this way a number of German counter-attacks were broken up, while others were repulsed by rifle and machine-gun fire of our infantry."

"On the 19th inst. the enemy's aircraft took advantage of the exceptionally strong west wind to make repeated attacks upon our artillery machines, turning East at once when approached by our scouts. Nevertheless, considerable artillery work was done with aeroplane observation, and many photographs were taken by us."

"Parties of hostile troops and transport were engaged with machine-gun fire during the day, and over 1½ tons of bombs were dropped on various targets. Another ton of bombs was dropped during the night on the enemy's billets and hutments, in spite of most unfavourable weather."

"Six German machines were brought down in fighting and four were driven down out of control. Seven of our aeroplanes are missing."

*General Headquarters, September 22nd.*

"On the 20th inst., during the first two hours of our attack, low clouds and a drizzling rain made flying almost impossible. However, our aeroplanes flew out at a low altitude and dropped bombs on a hostile aerodrome near Courtrai, besides firing at bodies of German infantry. As soon as the weather had slightly improved aerial activity became great. Contact was kept with our advancing troops, and both aeroplanes and balloons gave observations for our artillery. On several occasions the location of enemy troops preparing for a counter-attack was reported to our artillery, who successfully dealt with the situation. Who the attack was in progress our aeroplanes fired from their machine-guns over 28,000 rounds from heights ranging between 100 ft. and 1,000 ft. at the German infantry in their trenches and shell-holes, at reinforcements coming up to the battle, at bodies of hostile troops on roads and working behind the lines, and at hostile batteries, machine-guns, and transport."

"By day 68 bombs were dropped on Ledeghem railway station, 96 on two aerodromes north-east of Lille, and 103 on billets, hutments, and ammunition dumps in the battle area. At night, in spite of most unfavourable weather, two tons of bombs were dropped on Ledeghem, Roulers, and Menin railway stations. In the middle of the day German aircraft became very active, attempting to interfere with our artillery, bombing, and low-flying machines. In the evening, when the weather improved, they kept well east of the lines and were disinclined to fight. Ten hostile machines were destroyed and six driven down out of control. Ten of our aeroplanes are missing."

"On the 21st inst. the weather improved, causing great aerial activity. A great deal of successful work was done with the artillery, our aeroplanes and balloons ranging the guns on to hostile batteries, troops in trenches and shell holes, and other fleeting targets. Our low flying machines continued to harass the enemy's infantry and transport in both forward and back areas. Bombing was also continued, and four tons of bombs were dropped by day on Roulers railway station, on an aerodrome and billets in the vicinity of Lille, on an aerodrome south-east of Cambrai, and on hutments in the battle area. At night a further 6½ tons of bombs were dropped on Roulers, Ledeghem, and Menin railway stations, and on masses of transport and troops on the Menin-Ypres road. The enemy's troops and transport on this road were also effectively engaged with machine gun fire, many thousand rounds being fired by our machines from a height of 400 ft. Enemy aircraft were extremely active and aggressive until the afternoon. Activity then died down considerably, the enemy's machines keeping well east of the lines and refusing combat. Ten German aeroplanes were brought down in fighting and eight others driven down out of control. Another enemy machine was brought down by our infantry on the 20th inst., in addition to those already reported for that day. Twelve of our machines are missing, including two which have not returned from night bombing."

*Admiralty, September 22nd.*

"Naval works at Ostend were this morning bombarded by the ships of our Belgian Coast Patrol with satisfactory results. Three seaplanes, attempting to assist the enemy by observation, were shot down by our air patrol."

"During the night of the 20th and morning of the 21st bombing raids were carried out by naval aircraft on the following military objectives:—Aertrycke, Sparappelhoek, and Thourout aerodromes, and Thourout railway station. Bombs were also dropped near Atelier de la Marine, Ostend. A large quantity of bombs were dropped, with good results. Bombers were attacked by numerous enemy aircraft, which were driven off with the assistance of a Royal Flying Corps patrol. All our machines returned safely."

*Admiralty, September 23rd.*

"On the night of the 21st inst. our naval aircraft carried out bombing raids on Thourout and Cortemarck railway stations. Thourout Station and lines were hit and a fire resulted. At Cortemarck the station buildings were hit

and set on fire. Bombs were dropped on the docks at Ostend on the 22nd. All our machines returned safely."

*War Office, September 23rd.*

"Salonica.—During the week our aeroplanes have carried out successful local bombing raids on Puljovo, Kara Oglular (north-west of Doiran), and other places."

*General Headquarters, September 23rd.*

"On the 22nd instant misty weather resulted in a decided decrease in the great aerial activity of the last few days. Our aeroplanes, none the less, carried out successful bombing raids, and during the day dropped 134 bombs on hostile billets, hutments, and aerodromes. In the course of the night a further three tons of bombs were dropped on Roulers, Menin, and Wervicq railway stations. The enemy dropped a few bombs at midday, doing little damage. Four enemy aeroplanes were brought down in air fighting, and five were driven down out of control. Two of our aeroplanes are missing."

**French.**

*Paris, September 18th.*

"Yesterday five German aeroplanes were brought down in air fighting or by the fire of our machine guns."

*Paris, September 21st.*

"During the days of September 19th and 20th two German aeroplanes were brought down, and eight other enemy machines were obliged to land in a badly damaged condition."

"Salonica.—British airmen bombarded the enemy establishments to the north of Doiran."

*Paris, September 22nd.*

"Between September 10th and 20th 15 German aeroplanes and a captive balloon were brought down by our pilots. Twenty-nine German machines were driven down damaged within their own lines as the result of aerial fighting."

*Paris, September 23rd.*

"During yesterday our chaser aeroplanes had numerous fights. Eleven German aeroplanes and one captive balloon were destroyed by our pilots. During yesterday, and during last night our airmen showered bombs on the munition depôts of Donon, the factories of Hagondange, and the railway stations of Chambley, Thionville, Luxembourg, Metz-Woippy, Mezières les Metz, &c. In Belgium they bombarded the railway stations of Staden, Roulers, and Cortemarck."

**Italian.**

*Rome, September 22nd.*

"Last night one of our airships carried out an offensive action on the enemy encampments in the Chiapovano Valley, north-east of Gorizia, the station and hutments of Grahovo, and the railway works north-east of Prosecco (Gulf of Trieste). The operation, rendered very difficult by a sudden change for the worse in atmospheric conditions, and by the enemy's most intense and well-directed fire, was brilliantly executed, and the objectives were bombarded with four tons of high explosive bombs."

*Rome, September 23rd.*

"Last night one of our airships, navigating in unfavourable atmospheric conditions, returned to the Chiapovano Valley, and renewed the effective bombardment of the enemy encampments there."

**Russian.**

*L'etograd, September 18th.*

"Our pilot, Komarovsky, while making a reconnaissance, was attacked by an enemy aeroplane, which he brought down in the region of Lokatchi (in the direction of Vladimir-Volynski)."

*Petrograd, September 21st.*

"On September 19th on the South-Western and the Roumanian fronts there were several aerial engagements and our airmen brought down four machines in the German lines. In the region of Novo Selki our airman Vassilevsky brought down an enemy machine and the occupants have been made prisoners."

**German.**

*Berlin, September 18th.*

"Senior Lieut. Berthold again shot down two opponents in aerial battle."

"Our enemies undertook several bombing raids on September 16th against South German territory. Stuttgart, Tübingen, Freudenstadt, Oberndorf, Stingbert (?), Saarbrücken and Colmar were attacked. Near Stuttgart one soldier was slightly wounded. At Freudenstadt and Colmar damage was done to buildings. None of the other attacks caused either losses in killed and wounded or material damage. Three of the enemy aeroplanes were shot down on German soil."

*Berlin, September 19th.*

"Yesterday 16 enemy aeroplanes were shot down. Vice Sergt.-Major Thom shot down three opponents and Lieut. Thuy two."

*Berlin, September 20th.*

"Twenty enemy aeroplanes were shot down."

*Berlin, September 22nd.*

"The airmen took a prominent part in the fighting in Flanders. During the last two days 39 enemy aeroplanes and two captive balloons have been shot down. Three of our airmen fell. Senior Lieut. Schleich gained his 21st and 22nd aerial victories. Lieut. von Bulow shot down his 21st opponent, Lieut. Wüsthof and Lieut. Adam both shot down two enemy aviators."

*Berlin, September 23rd.*

"Yesterday morning an English monitor, assisted by aerial observers, bombarded Ostend. A few shells struck the cathedral, in which early mass was being held. Seven Belgians were killed and 24 seriously wounded. The monitor was driven off by the fire of our coastal batteries."

# MAGNETO IGNITION.

## I.—A SIMPLE EXPLANATION OF THE FUNDAMENTAL PRINCIPLES.

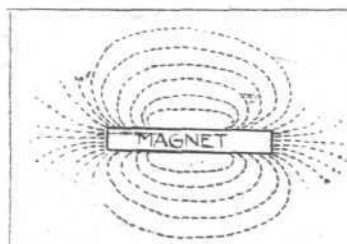
WHATEVER basis of truth there may be in the ancient Greek legend that the powers of the magnet were discovered by Magnes—the young slave of Medea—finding himself held fast by the iron nails which were under his shoes as he walked over a lodestone mine, the fact remains that the electrical properties of the magnet have come to play a vital part in propelling the swiftest vehicles which man has so far invented.

To the uninitiated the high tension magneto may appear to be "a box of tricks," but it is, in reality, a wonderful piece of mechanism—how wonderful can only be realised when it is remembered that it is called upon to produce something like 5,000 separate and distinct sparks every minute, each one of those sparks having to occur at a certain, definite time. How well it performs its task is shown by the scant notice it

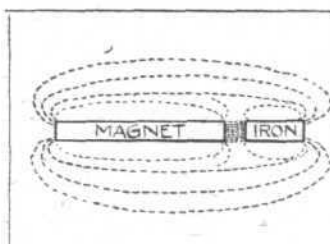
to have acquired the power of being able to attract to itself small pieces of paper. This phenomenon was observed by the early Greek philosophers and the word electricity is, in fact, derived from the Greek word for amber.

An electric current can also be produced, this time by chemical action, if certain materials, such as zinc and carbon, are connected by a piece of wire and then immersed in a solution—in this case sal-ammoniac and water. The resultant chemical changes will cause a current to flow in the wire and this is, in simple terms, what is known as the wet battery commonly used for the household electric bell. Another form of much the same thing is the popular dry cell used for a similar purpose, as well as for portable lamps, and other things where only a small amount of current is required.

A third method of exciting an electric current is by utilising



**Fig. 1.**—If a sheet of cardboard is laid on a bar magnet, and iron filings sprinkled thereon, they will arrange themselves into a field of well-defined lines as seen in this diagram.



**Fig. 2.**—If a piece of iron is placed near the end of a bar magnet it will temporarily become a magnet itself. Also, if the magnet is cut into several pieces, each one will be a complete magnet.

usually receives, and many people were frankly surprised that such an insignificant looking fitting should have been deemed worthy of having a whole paper to itself during the last session of the Aeronautical Society. That paper was taken up mainly with the scientific and technical aspects of the design and manufacture of magnetos; it is with quite a different purpose that these notes are written—it is hoped that they will enable those who have to deal with magnetos in the course of their work to understand something of the why and wherefore of the apparatus.

"What is electricity?" is a question which is often asked, and it is one by no means easy to answer in such a way to be understood of the people. An easier question, and one which to a certain extent covers the other, is, "What makes the electricity?" To that the answer is simple. There is no need to make it for it is always ready to our hand. We live in an electrical world with electricity existing passively in everything. We learn from scientists that the atoms, which build up all things, are composed of two different sorts of corpuscles—or electrons—one sort being called positive, while the others are termed negative. In the ordinary course they neutralise one another and if we want to utilise the electricity it is necessary to separate the positive from the negative corpuscles, when a current will be caused.

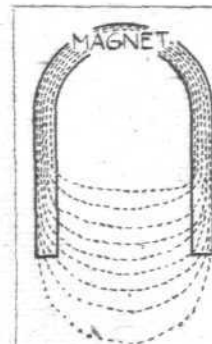
It is, however, easier to set electricity in motion in some substances than in others. In copper and most metals, for

the properties of the magnet, and this is the one we are concerned with.

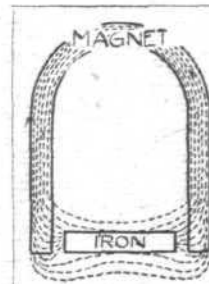
Before proceeding to describe the actual mechanism used to produce the spark it may be as well to consider the characteristic features of a magnet. There are two classes of magnets, one—known as permanent magnets—which are either pieces of magnetite—the lodestone of the ancients—or hard steel which has had the magnetic properties imparted by being brought into contact with another magnet. The second class of magnet—generally called an electro-magnet—usually consists of an iron core surrounded by a coil of wire and it only becomes a magnet when a current of electricity is flowing through the wire. For the moment, however, we need only consider the permanent magnet, usually made of tungsten steel, i.e., a steel which has had a certain amount of tungsten incorporated in it for hardening purposes.

If a bar magnet is taken and some iron filings are sprinkled round it will be found that the filings will cluster at either end, none being attracted to the middle. This shows that the magnetic power is strongest at the ends, hence they are called the poles, while the centre of the bar is known as the neutral portion. If a bar magnet is cut into pieces each becomes a complete magnet with its poles at either end. Also a piece of soft iron when placed a short distance from one of the poles will take on the characteristics of the magnet, only to lose them again when it is withdrawn from the magnet.

Another way of demonstrating this peculiar property of the magnet is to lay a piece of cardboard upon it and sprinkle



**Fig. 3.**—If the bar magnet is bent into the form shown in this diagram, the magnetism becomes very intense between the two poles. Except where they are crossing the space from the positive to the negative pole, the lines crowd into the magnet, thus completing the circuit. The conditions are now the same as in the ordinary horse-shoe magnet.



**Fig. 4.**—If the piece of iron is arranged to rotate between the poles of the bent magnet, it is alternatively magnetised, demagnetised, and remagnetised in the opposite direction. A coil of wire wound on the piece of iron would become electrically energised by the magnetic changes in the iron.

instance, the corpuscles can move without much difficulty and they are known as conductors. In cotton, air, indiarubber, &c., there is great resistance and they are known as non-conductors, or insulators.

Here it may be pointed out that there is a great difference between electricity and a current of electricity. The distinction may be made clear by an analogy. We live surrounded by the atmosphere but normally we are unaware of its presence until there is a change in the conditions when pressure being brought to bear at a certain place, a wind is caused, which we feel. Similarly, the electricity, which is in everything, remains unnoticed until it is set in motion.

There are several ways of setting it in motion. One simple method is to rub, with a piece of flannel, a stick of amber, sealing wax, or other similar substance, when it will be found

the iron filings thereon, when they will be found to arrange themselves in certain well-defined lines, as shown in the diagram, Fig. 1. The arrangement is facilitated by lightly tapping the cardboard so as to vibrate the iron particles. If a piece of soft iron is now placed in the vicinity of one of the poles, see Fig. 2, it will virtually form an extension of the magnet, a great many of the magnetic lines crowding into the iron and transforming it for the time being into a magnet.

A horse-shoe magnet, which, after all, is only a bar magnet bent so as to bring its poles opposite to each other, can be experimented with in the same way, and it will be found that the magnetic field is mostly confined to the region between the poles, as shown diagrammatically in Fig. 3.

If the piece of iron is placed between the poles most of the magnetic lines of force will pass into the iron, as shown in

Fig. 4. As is well known, one pole of a magnet always tries to point to the north—a quality which is taken advantage of in the compass—and that is usually referred to as the north pole. The magnetic lines of force always flow from the north to the south pole, so that if the iron is rotated it will be magnetised, demagnetised and remagnetised continually.

It has been pointed out that if wire is coiled round an iron core and a current of electricity is sent through the wire, the core will become a magnet. The reverse is likewise the case; if a magnet is passed through a coil, a current of electricity can be induced in the wire. This is because the influence of the magnet extends to the space surrounding it, called the magnetic field, and this influence as it passes through the coil of wire separates the positive from the negative corpuscles in the copper wire, thus setting the electricity in motion. If the piece of iron, after having a coil placed round it, is rotated between the poles of the magnet, a current of electricity will be found flowing through the wire, for the iron, although not a magnet itself, being alternately magnetised and demagnetised, provides exactly the same effect as though a magnet were being continually passed through the coil.

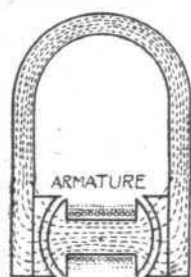


Fig. 5.—In a magneto shaped pole pieces are fitted at the ends of the magnets, while the armature has its ends shaped to a similar curve, so as to bring the magnetic lines under better control. The wire of the armature coils is shown in section.

To take advantage of this fact, in the magneto the poles of the magnets are fitted with pole-pieces—pieces of iron with the inside face forming the segment of a circle—while the ends of the armature—a sort of shuttle carrying a coil and corresponding to the piece of iron used in the earlier experiments—are so shaped as to leave just sufficient clearance between it and the pole-pieces when it is being rotated. This arrangement is shown in Fig. 5.

Here the magnetic lines of force are observed to be passing through the centre of the armature—and the coil—taking the shortest cut from pole to pole. When the armature is turned the magnetic lines are stretched until the position shown in Fig. 6 is reached. As the armature reaches this position the greater part of the lines are going from the north pole of the magnet through the uppermost part of the armature and down the coil to the south pole, but some are making their way straight across. As the armature passes this point the magnetic lines divide, one half going through the top of the armature and the other half through the bottom, without passing through the coil. Then the electrical impulse is at its maximum intensity, as the wire of the coil has "cut" through all the lines of magnetic force. Immediately afterwards the magnetic lines commence to flow through the coil in the reverse direction, going in through the bottom part of the armature and out at the top. This gradually increases until the zero position is reached when the magnetic lines are all going through the coil again.

It is when the wire is cutting the magnetic lines—or, in other words, passing through the magnetic field—that the current of electricity is generated. The faster the coil cuts

the lines, the greater will be the pressure—or voltage—of the current generated. When the armature is in the position shown in Fig. 5, the coil is, as it were, sliding along the lines of force and not cutting any; consequently that is known as the "zero" position. When the coil is cutting the lines at the greatest rate is when it is moving at right angles to them, and that is when the armature is passing the vertical, as in Fig. 6, which is known as the maximum position. Between its zero and maximum positions the coil is only cutting the lines diagonally, and consequently the rate at which they are being cut is slower than the maximum. During the whole of the time the armature is passing from the horizontal to the vertical position there is a steady rise in the voltage from zero to maximum, and then it falls back to zero as the armature approaches the horizontal again.

It will thus be seen that the current of electricity is not a steady, continuous flow, but is in the nature of a series of surges or impulses, two of which—one in each direction—are obtained during every revolution of the armature. It is possible to obtain four impulses in each revolution by having

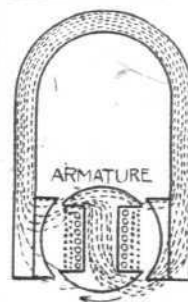


Fig. 6.—The electric impulse is at its maximum intensity at the moment of demagnetisation, which happens soon after the core has passed the vertical position shown in the diagram. This is when the coil of wire is "cutting" the magnetic lines of force at the greatest rate.

a stationary armature and revolving a sleeve between it and the pole-pieces, but that will be explained later.

Having reached this point and seen how the current of electricity is generated, reference may be made to the way in which it is measured. For this purpose the electric current may be compared to a stream of water, although the analogy—like all analogies—is not rigorously true. The quantity of electricity, corresponding to gallons of water, is measured in coulombs, a name which commemorates the French physicist, Charles Augustin Coulomb. The current, in coulombs per second (corresponding to gallons per second) is measured in amperes, or more simply amps., which perpetuates the work of another Frenchman, André Marie Ampère, who among other work in electro-dynamics, demonstrated the relations between magnetism and electricity. The ohm, named after a German professor, is the unit of electrical resistance, corresponding to the resistance of pipes to the flow of water while the unit of pressure (or E.M.F.) is the volt, an abiding memorial of the work of the Italian physicist, Count Alessandro Volta, who invented several electrical instruments. This unit corresponds to pounds per square inch, or feet of head water pressure, in the water analogy. Just as when the pressure, or head, is increased more water will pass through a given pipe per second, so by increasing the voltage, more electricity flows through a given wire per second. Conversely, if the size of the pipe is increased and the pressure remains as before more water passes, so, in the same way, if the resistance of the wire is reduced more electricity passes.

(To be continued.)

#### Aircraft Work on the Euphrates.

A NOVEL use for aeroplanes was found the other day when two of our machines were the cause of the surrender of a small enemy detachment at Diwaniyah, on the Euphrates, says Mr. Edmund Candler in a message from Baghdad, dated September 21st. The garrison had been left there in charge of sick and stores by the Turkish Euphrates force in the second week of March during their retirement from Samara to Ramadi at the time of our occupation of Baghdad. They held out for some months at Diwaniyah in the hope that the Euphrates might be reoccupied by the Turks.

At the end of July a number of the garrison surrendered to the townspeople, and were handed over to us, but a single officer and some 30 men refused to yield until the aeroplanes came and bombed the house in which they had taken refuge. The lieutenant and his detachment formed a last batch of isolated Turks who have hung out in the remote districts between Nasiriyah and our posts farther north on the Euphrates.

#### Aircraft v. Infantry.

In his despatch to the *Daily Telegraph* dated from France on September 22nd, Mr. Philip Gibbs says:—

"Along the Menin Road later in the day came another long column of marching men. They were men of the 16th Bavarian Division, who had been sent up in urgent haste. Over their heads in the darkness, under the stars, flew a British aeroplane, with a bomb of the heaviest kind. When our airman saw these hostile troops advancing, flying low like a great black bat, he dropped his frightful thing on the head of the column. It burst with a deafening roar and scattered the leading company. Flying in the same sky space as the big aeroplane were a number of other night raiders of ours. They also flew low above the marching troops, and all down the road dropped their explosives. Our guns added their help, and they fired many rounds down the Menin Road, bracketing the ditches . . . with those birds of prey above them the Bavarians must have suffered the worst kind of horror. They did not get near to our lines."

# THE SOCIETY OF BRITISH AIRCRAFT CONSTRUCTORS.

## OFFICIAL NOTICES.



THE Second Annual General Meeting of the Society of British Aircraft Constructors was held on August 29th at Caxton Hall, S.W., when the Society's Annual Report and Accounts were submitted.

The Chairman, Mr. H. White Smith, stated that before asking those present formally to adopt the report and accounts, he would like to take the opportunity of making a few remarks upon the general position of the Society.

He would point out that, owing to the way in which the industry had grown, a representative trade organisation became much needed, and, as stated in the Annual Report, the co-ordination of the industry effected through the Society had, in the opinion of the Management Committee, unquestionably been of distinct national benefit. Many problems arose from time to time in which an organised body was absolutely necessary, and no doubt there would be a large number of difficult problems to be tackled when peace came, when it would be even more important to have a strong representative society.

As regards the work done, the Chairman said that he had been running through the minutes of the different meetings, and while it would take too long to detail all that had been undertaken, he would like to refer to a few matters. Before doing this, however, he wished to say that the Management Committee had adopted the policy of communicating immediately with members on all points that arose from time to time. It was felt that that was the better course. It meant worrying members sometimes, but he thought it was better to err on the side of consulting members on matters affecting them.

One of the interesting events of the year was the arrangement entered into with the Aeronautical Society of Great Britain, referred to in the report. There was a Standing Joint Committee of the two Societies before whom matters of interest to the two bodies came. One very important matter which the Joint Committee had been considering was the question of the formation of a Research Association for the aeronautical industry, which subject was to be laid before the Council of the Society.

The Chairman, after referring to the steps which had been taken during the year in various matters of interest to the industry, stated that the Management Committee had various important matters in hand at the present moment, and he felt sure that the Society would be of increasing usefulness to its members as time went on.

A resolution adopting the report and accounts for 1916 was then passed, as also was a resolution to the effect that the present Council should remain in office until the next general meeting. The auditors, Messrs. G. A. Touche and Co., were re-elected.

Immediately following the General Meeting, a meeting of the Council of the Society was held, at which Mr. Hamilton Barnsley (Lanchester Motor Company, Ltd.), Mr. E. Allen (C. G. Spencer and Sons, Ltd.), and Capt. R. L. Charteris (A. B. C. Motors, Ltd.) were added to the Council, and Mr. Stuart A. Hirst (Blackburn Aeroplane and Motor Company) was elected to the Council in place of Mr. Robert Blackburn.

Mr. H. White Smith was unanimously re-elected Chairman of the Society. Mr. R. O. Cary, Mr. L. Coatalen, Mr. J. D.

Siddeley and Mr. Howard T. Wright, the four members of the Committee of Management who had retired and offered themselves for re-election, were unanimously re-elected; and Sir Herbert Austin and Mr. F. Handley Page were elected to fill two places on the Committee left vacant by the resignation of Mr. H. V. Roe and Mr. B. Caillard.

Discussion then followed upon the proposed formation of a Research Association for the aeronautical industry. It was pointed out that the Government had set up a new department—the Department of Scientific and Industrial Research—and had placed a fund of a million sterling at the disposal of that department to enable it to encourage industries to undertake research.

Briefly, the scheme proposed by the Government is that special Research Associations shall be formed by manufacturers, and that a programme of research shall be drawn up, the department making a contribution towards the income raised by the Association for carrying out such programme. The department would have to approve the research programme, but it is laid down that the Research Associations are to be formed to carry out a programme of research and not for any particular item of research. The Government contribution would not be more than pound for pound, and the contribution would be promised for a period of years to be agreed upon and not exceeding five. Contributions by firms to a Research Association formed under conditions approved by the department would be allowed as a deduction for income tax and excess profits duty purposes.

A draft Memorandum of Association for such Research Associations has been prepared by the Department of Scientific and Industrial Research. Put shortly, this Memorandum provides that the objects for which the Research Association is established are:—

- (a) To promote research and establish laboratories.
- (b) To accept grants of Government money, &c.
- (c) To employ technical advisers.
- (d) To establish museums, libraries, &c.
- (e) To investigate inventions, &c., for the purposes of the industry.
- (f) To co-operate with other associations.

The position of the aeronautical industry in relation to this scheme for the development of scientific and industrial research has been under careful consideration by the Standing Joint Committee of the S.B.A.C. and the Aeronautical Society, and conferences have been held with Sir Frank Heath, the Secretary to the Government department in question.

One of the conditions laid down by the Department of Scientific and Industrial Research is that the initial composition of the Board of Management of the Research Association must be approved by the department. Subsequently, the nominations for Chairman of the Board and for one half of any vacancies that may occur on the Board have to be approved by the department. The Board of the Association has to appoint a Director of Research or other responsible technical adviser, who could be entrusted with the general direction and supervision of the research work undertaken by the Association.

After discussion of various points involved, it was decided that a Research Association for the Aeronautical Industry should be formed.

### Fatal Accidents.

LIEUT. LICHFIELD, R.F.C., was killed at Dartford on September 24th, through his aeroplane nose-diving and crashing to earth. The observer, Lieut. H. Nunn, R.F.C., who jumped from the aeroplane, was seriously injured.

"Death from Misadventure" was the verdict returned on September 24th at inquests on 2nd Lieut. Ernest Hargrave, R.F.C., and 2nd Lieut. Victor Bracey, R.F.C., who lost their lives in flying accidents during the week-end.

### Runaway Kite Balloons.

DURING last week the residents of South London had the experience of seeing several kite balloons run amok. On September 20th one which had broken away was seen to catch fire, and the pilot, releasing his parachute made a safe landing near Chelsea Bridge. The remains of the balloon fell at Dulwich.

On the following morning five kite balloons which had been

tethered together for experimental purposes broke away, in a gale, from Roehampton. Two air-mechanics were caught by the ropes and dragged into the air. One, named James, let go and fell after the balloons had travelled a short distance, while the other, named Peggs, fell at South Norwood. He fell out as the balloons were passing South Norwood at a height of 2,000 ft. and was killed. The derelict balloons were eventually shot down by anti-aircraft guns.

### A Chance for an Engineer Organiser.

IN our advertisement columns there appears this week an enquiry for a works manager who is a works manager. The factory is in the London district, and the opening is an exceptional one for a really good organiser, with engineering experience behind him. Over 2,000 hands are employed. Any of our readers interested should send a line in confidence to Messrs. George Reader and Co., Solicitors, 35, Coleman Street, E.C., who are in the first instance acting for the owners.

## SIDE-WINDS.

IN connection with the Arrol-Johnston works at Dumfries there is a cadet corps which is going strong. It recently held a week-end camp at Lochmaben, when 150 cadets were present under canvas. Although the weather was showery for the march out, it cleared later, and cadets had a comfortable but busy time with drills, parades, &c. On Sunday afternoon Mr. J. C. Pullinger inspected the cadets, and in a short address congratulated them on their smart appearance and expressed the hope that they would be able to arrange for a larger camp next year.

A FLUXLESS aluminium solder, embodying wonderful adhesive powers and easy usage with extreme hardness of material, is the speciality of the Engineering Products Co. of 199, Piccadilly, W. The inherent difficulties attaching to the working of aluminium, where joints have to be made, are rapidly being overcome in various ways, and the production of such a solder as that under notice goes far in the direction of reducing them. Articles soldered with this invention offer such a clean joint that, where finishing and polishing follows, the actual joint is hardly perceptible, the solder being the same colour as the article, and taking the same polish. Its tenacity is such that two strips of aluminium overlapped and soldered together with an overlap of about one square inch has resisted a pull, administered by an independent constructor, of 3,300 lbs. without the slightest parting of the two surfaces, although the metal itself was torn asunder under the strain. The hardness of the material of which the solder is composed may be taken advantage of where bolt-holes have to be drilled in aluminium. Owing to the softness of this metal, these holes are likely under constant usage to become enlarged, or the threads stripped. By drilling a slightly larger hole than is required, and filling this with the solder, a re-drilling to the required size gives a material which threads easily and yet offers a much harder wearing surface. New teeth may be built up on aluminium gear wheels by deposition and machining afterwards, and large holes such as might happen in crank cases may have a piece let in and soldered round, making thereby an almost invisible mending. A matter of note and importance is that the solder is used in connection with an ordinary gas blow-pipe, or a soldering iron with a steel bit, thereby avoiding the extreme heat which is so liable to spoil the temper of the metal parts. Fuller particulars of this new solder may be obtained by writing to the company as above.

MANY of our readers will be personally acquainted with Mr. Coulson, for some years managing director of the Wooler Engineering Co., in which concern he still holds an interest. Mr. Coulson is now firmly established as the Aeroparts Manufacturing Co., and has offices at 199, Piccadilly. The new firm are chiefly concerned in metal work of other description for aeroplanes, and therefore in no way overlap the Wooler Co. in their manufacture of eyebolts and the like, and their machining operations. At the works at Parsons Green, all tubular parts,

welding, and similar work is carried out, whilst at Empress Works, Brook Street, Holborn, such matters as tanks, metal frames for rudders and elevators, and all kinds of constructional work is undertaken. Mr. Coulson would be pleased to receive any of his old friends, and is equally anxious to make new ones in connection with the supply of aero parts.

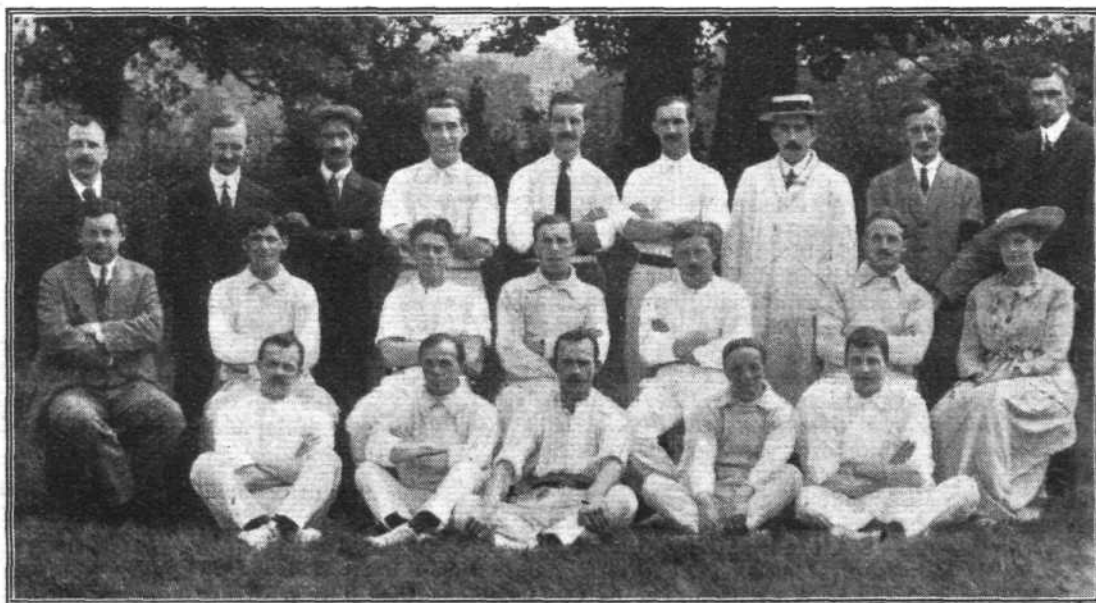
MR. G. P. H. DE FREVILLE informs us that he no longer has any connection with the firm of Ware and de Freville, Ltd., having resigned from the Board of that company as long ago as March last, in order to devote himself to the Aluminium Alloy Pistons, Ltd., of which firm he is Managing Director.

IN order to facilitate the receipt and transmission of urgent telephone messages in connection with the experimental tests and official acceptance trials carried out by the firm on behalf of various aircraft manufacturers, the Procter-Issac Aviation Co., of 166, Piccadilly, London, W. 1, have installed an additional telephone line, which has necessitated a change of number. The new number is now Gerrard 278 (2 lines). The telegraphic address remains the same, i.e., "Aeromina, Piccy, London."

FOR so late in the season the weather was in its best humour on Saturday, when the staff and employees of the Selsdon Aero and Engineering Co. (of Croydon and Sanderstead) broke away from their labours of supplying parts for aeroplanes, to enjoy a well-earned day of recreation on the river. Somewhere about three hundred thoroughly enjoyed the trip, and to many the beauties of the river from Richmond to Chertsey were revealed for the first time. As the organisation of the trip had been undertaken by the London Manager, Mr. Brown, it need hardly be said that all the arrangements were admirable. Mr. Camplin, the Managing Director, was very alert in looking after the welfare of his employees, inasmuch as he kept a very watchful eye to see that everyone of them were getting the maximum amount of fun and enjoyment out of the trip. Leaving Richmond at 9.45 Chertsey was reached at a quarter-past one, and on arrival all arrangements for the comfort of the party were found to be in perfect order, Mr. Brown having denied himself the pleasure of the river, and going down by train so that everything might go off without a hitch, a little bit of self-sacrifice which was very greatly appreciated by the whole of those who participated in the outing. Subsequent to refreshments for the inner man Croydon and Sanderstead vied with each other in various sports, and demonstrated that they are as thorough in their play as in their work.

ONCE again the Aircraft Supplies Co. have had to seek larger quarters, and this time they have settled upon 125, Long Acre, W.C. 2, which becomes "Ascol House." Here in addition to the General Offices of the company and the extensive stores—containing nearly 2,000 bins—will be opened what are believed to be the first showrooms devoted entirely to aircraft

The Integral Propeller Co.'s Cricket Team, which won the Championship of No. 1 Division in the London Munitions Cricket League.—As Divisional Champions, this team had to meet W. and G.—the leaders of Division 2—for the League Championship, but were unfortunately defeated by them. The Integral was the only team of aircraft manufacturers proper which reached this stage. Sitting on the extreme left of the picture is the Managing Director, Mr. H. E. Latimer-Voight, President of the Integral Cricket Club, who, in pre-war days, was an enthusiastic cricketer and member of various cricket clubs. On the extreme



right is Mrs. Latimer-Voight, Vice-President of the Cricket Club, and also a Director of the Company. Behind Mrs. Latimer-Voight stands Mr. Saunders, the Works Manager, while Mr. Stewart, the foreman, is standing immediately behind Mr. Latimer-Voight.

parts and equipment where the actual parts may be examined and from which supplies may be taken away without any delay whatever.

The change has necessitated an alteration of telephone number to Gerrard 276 (two lines), and the telegraphic address will now be "Upcast, Rand., London." It is significant that this enterprise on the part of the firm has taken them into what used to be called the "motor quarter," especially bearing in mind that there is hardly a motor car firm who is not engaged on aircraft production in some form or other, and it is obvious that these firms will also play an important part in the production of aircraft after the war.

Aircraft manufacturers will find that this company's Illustrated Fortnightly Stock and Quotation List will materially assist them in speeding up and increasing their output. Copies will be sent on application. The works, which have been fitted with many new machine tools, are being extended, and remain for the present at Little James Street, Holborn, W.C. 1, and the West End Offices of the Company are at 166, Piccadilly, W. 1, as hitherto.

THE grounds of the Harlesden Cricket Club were the scene, the other day, of the first annual sports (combined this time with the entertainment of wounded soldiers) of the Bowden Wire Social and Athletic Club—an organisation of the workers of Messrs. Bowden Wire, Ltd., London. The day was fine, the attendance large and the whole affair enthusiastic and enjoyable—thanks in no small degree to the efforts of the managing director, Mr. J. R. Nisbet, and the firm's chief representative, Mr. Alec. Ross, both well known and experienced in the realms of sport. In the 100 yards scratch race a popular winner was Mitchell, a discharged soldier, who had worked very hard for some weeks past in training the tug of war teams. The  $\frac{1}{4}$  mile handicap was rather easily won by Holdsworth. The  $\frac{1}{4}$  mile obstacle race fell to Kemp, and the 100 yards ladies' to Miss Byford. As usual, the most popular events were the tugs of war—one for men and one for women—arranged with the firm's neighbours, Messrs. Lyon and Wrench. Bowden Wire ladies' team were the winners of their event, but the men's team succumbed rather easily to the Lyon and Wrench representatives. The wounded soldiers who were the guests of the afternoon asked for a one handed pull against a picked team, and enthusiasm ran high when they won after a good pull.

MR. F. T. NETTLEINGHAM, late Observer R.F.C., has rejoined Messrs. C. Grahame-White and Co. at Hendon.

JOHN MACLELLAN AND CO., of 30, Newgate Street, wish to call attention to the fact that all materials supplied by them are now held in large stocks and can be supplied immediately. Also to the ever increasing cost of raw materials and the difficulty of obtaining them. Smallware merchants and manufacturers of tapes, webs, cords, &c., since 1875, they have found a curious overlapping of the wants of their old customers in the electrical and similar trades with that of aeroplanes and airship building, many of their manufactures being used in both. All kinds of tapes, cords, webs, bindings, threads and lacings are obtainable, and they wish especially to call attention to their new jute packing webs which, of about 2 in. wide and extremely strong, are used for bindings and slings where machines are packed for transport.

THE deferred events—owing to the great length of the programme—from the Sopwith sports meeting of Saturday, September 5th, were competed for last Saturday, at the Old Kingstonians ground, Norbiton, on the occasion of a football match between Sopwiths and The Aircraft Manufacturing Co. A full list of results as officially returned is as under:—

**Sack Race Final.**—1, Stanton; 2, Stretton; 3, V. W. Derrington.

**Choral Society Competition.**—1, Mr. Shirley and partner; 2, Mr. A. Bale and partner; 3, Mr. Chester and partner.

**100 Yards Works Championship Final. Run off from dead-heat.**—1, J. Whitehorn; 2, V. W. Derrington.

**Ladies 50 Yards Backwards Race.**—1, Miss Syke; 2, Miss Byde; 3, Miss Spillman.

**Novelty Costume.**—1, Miss O'Connor; 2, Miss Russell.

**Boot Race.**—1, Stanton; 2, J. D. Stranks; 3, A. Bale.

**220 Yards Handicap (Members of Sopwith Harriers only).**—1, J. Whitehorn; 2, J. W. Wilson; 3, A. C. Mayell. 1st prize for above was presented by Mr. F. Sigrist.

**Band Race.**—1, T. Smith (conductor); 2, W. Sex; 3, Locke.

Mr. Sigrist ably performed the duties of referee, and at the conclusion of the sports Miss M. Sopwith again very gracefully presented the prizes.

## CORRESPONDENCE.

### Parachutes.

[1947] It is all very well talking about parachutes, but how on earth, or rather in the air, are we to be instructed in the use of them? No doubt most of us could, in an emergency, do what we wouldn't care to do in cold blood, but if I were suddenly detailed to go through a course of parachuting my comment would be "Not in these trousers."

ANTICHUTE.

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### PUBLICATIONS RECEIVED.

*Royal Flying Corps (Military Wing). Casualties and Honours during the War of 1914-17.* Compiled by Capt. G. L. Campbell, R.F.A., assisted by R. H. Blinkhorn. London: The Picture Advertising Co., Ltd., Cromwell House, Holborn. Price, cloth covers 3s.; paper covers 1s. 6d.

*A Practical Manual of Autogenous Welding (Oxy-Acetylene).* By R. Granjon and P. Rosemberg. Translated by D. Richardson. London: Charles Griffin and Co., Ltd. Price. 5s. net.

*Types of British Aircraft.* London: Brown Brothers, Ltd., Great Eastern Street, E.C.

*The Motor, Marine and Aircraft Red Book, 1917.* Compiled by W. C. Bersey and A. Dorey. London: The Technical Publishing Co., L. Price 7s. 6d. (post free 8s.).

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### IMPORTS AND EXPORTS, 1916-1917.

AEROPLANES, airships, balloons, and parts thereof (not shown separately before 1910). For 1910 and 1911 figures, see "FLIGHT" for January 25th, 1912; for 1912 and 1913, see "FLIGHT" for January 17th, 1914; for 1914, see "FLIGHT" for January 15th, 1915; for 1915, see "FLIGHT" for January 13th, 1916; and for 1916, see "FLIGHT" for January 11th, 1917.

	Imports.		Exports.		Re-Exportation.	
	1916.	1917.	1916.	1917.	1916.	1917.
January ...	1,509	10,842	6,399	67,033	Nil.	Nil.
February ...	6,444	9,479	30,693	26,512	—	6
March ...	3,388	11,158	17,872	58,517	7	—
April ...	3,383	21,141	22,608	21,151	3,783	—
May ...	1,986	6,877	26,165	59,713	300	—
June ...	4,986	2,670	50,287	14,647	—	—
July ...	2,072	9,104	12,932	106,250	—	—
August ...	2,583	18,680	13,555	68,315	420	258
	26,351	89,951	180,511	422,138	4,510	264

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### Aeronautical Patents Published.

#### Applied for in 1916.

The numbers in brackets are those under which the specifications will be printed and abridged, &c.

Published September 27th, 1917.

- 12,154. J. V. MARTIN. Aircraft wing structures. (109,081.)  
12,317. WOLSELEY MOTORS, LTD., AND T. WARDELL. Supply of combustible mixture to aircraft engines. (109,099.)  
15,617. SOPWITH AVIATION CO. AND T. SOPWITH. Axle for aeroplanes. (109,146.)

#### Applied for in 1917.

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- 1,396. F. H. GILBODY AND G. DURRANT. Brackets for pulleys, &c. (109,202.)

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